The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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On the Eve

As we go to press the result of the General Election is still in suspense. By the time this issue reaches our readers the result will be fully known. In the meantime speculation is useless, and in any case is more than usually difficult on account of the cross-thinking and cross-voting which have to be reckoned with. One result which must be regarded as possible is a position of such equality between the three parties as to give no one of them any mandate for radical changes. The Unionist party have to gain a decisive working majority over both Liberalism and Labour to justify and enable them to introduce changes in our fiscal policy. If, while remaining the largest of the three parties, they are out-voted by Liberalism and Labour combined, then Mr. Baldwin's scheme will be in the same position as Mr. Joseph Chamberlain's Tariff Reform proposals, and the verdict will be one for Free Trade. If, again, Labour is in a minority, the capital levy idea is killed, for both Unionists and Liberals are practically united against it. In the event of the relative positions of parties remaining roughly what they are, things will probably drag along for a time with the prospect of another appeal to the country at no very distant date. It is common to assume from the respective points of view that Protection in the one case and Free Trade in the other are absolutely essential to national prosperity. There is another view which is at least possible. With our incomparable national genius for working compromises, it is conceivable that we may still go on prospering under any fiscal system. Our commercial and financial strength—which has been demonstrated in recent years in so remarkable a fashion—is the result of the British capacity for business. That, in any case, will remain, helped or hindered as the case may be by this or that system, and while it remains it will carry the nation through.

Iron and Steel Conditions

WE learn from a Northern metallurgical correspondent that there has been a distinctly brighter tone in the iron and steel industry during the past month. The long-awaited improvement seems to have set in, and manufacturers have now more cause to be hopeful than for many months. The first visible sign of the movement was in the pig iron market, when, towards the end of October, an advance of 4s. to 5s. per ton was made in the price of Cleveland pig iron. There was a strong demand and some heavy sales were made. The suddenness of the advance was something of a surprise, but makers wisely refrained from encouraging anything in the nature of a boom. The lessons taught by past experience have not yet been forgotten. Consequently there has been no further material advance during the month, but prices have remained firm, with an upward tendency. This has resulted in an all-round healthier position; and the improved trade outlook and the prospects of a settlement of the boiler-makers' dispute have helped to lift the industry out of the depression which has lasted since the spring. We are not yet on high ground, but the future is more promising. Although there has been a fair amount of work given out, the buying has not been all or chiefly on account of definite orders. Consumers realised that prices had reached the bottom, and there has been a considerable amount of forward purchasing in anticipation of increased demand with accompanying higher prices.

For the steel trade, the month of November has been decidedly more cheerful. The steel industry has been passing through the most trying period in its history, and the depression has lasted so long that many works have found it difficult to carry on. In the early part of the year there were signs of a revival. The French occupation of the Ruhr had resulted in the diversion of a certain amount of trade to this country and there was every appearance of an approach to more normal trading conditions. It was very soon realised, however, that the effects of the occupation had not been rightly gauged, that the French were there to stay, and the knowledge that the dislocation of the economic life of Europe was likely to be intensified rather than relieved quickly reversed the more optimistic tone that was beginning to prevail to one of even more settled

despondency than before. Orders became scarcer, and what work there was to be had was taken at prices which were hopelessly on the wrong side.

It is common knowledge that the prices at which steel has been sold during the year have entailed considerable loss to the makers. There are various reasons for this, but the makers have themselves been partly to blame. During and since the war the productive capacity of many of the works has been largely increased, and the manufacturers have found themselves in the position of having large plants with very little work for them. There was thus introduced into the country a new element of competition, which, added to the already keen competition from abroad, occasioned a suicidal policy of price-cutting. With the better trade outlook, the time has come to bring the selling prices more nearly in proportion to the cost of manufacture, and the revival of the two Associations is a definite step towards that end.

The Small Bar Association includes most of the important makers in the country, and its first action was to raise the price of small bars to £11 per ton, with various rebates for special quantities. This is a distinct improvement on the prices hitherto ruling; and it is very probable that a further advance will soon be made. The Steel Makers' Association has also advanced the prices of plates and sections, plates being now £10 to £10 10s. and sections £9 15s. to £10. Even these prices, and notably those for plates, are below the actual cost, but a start has been made in the right direction and a gradual progress is preferable to a sudden jump.

The Caking of Sulphate of Ammonia

So far as sulphate of ammonia is concerned the present is a time of attention to quality—both chemical and physical. Nearly all producers, thanks largely to the propaganda of the B.S.A.F., have learnt to appreciate the value of the neutral salt, and possibly the next most important consideration is that of avoiding caking. Neutrality and non-caking properties usually go hand in hand, but very much depends upon the treatment accorded the salt after it leaves the saturator, so that with an acid-free material there is by no means any guarantee that lumps will be avoided. At Newcastle recently Mr. Bernard Richardson remarked in a paper that it is manifestly incumbent upon sulphate producers to supply a material free from these defects if competition with other types of manures is to be met, especially as the farmer of to-day is particularly keen at weighing up the pros and cons of the various nitrogenous substances available. It will sometimes be found, even though every precaution has been taken and the salt shows a neutral reaction, with only 0·1 to 0·05 per cent. of moisture present, that caking does take place, and in such instances the trouble is in all probability due to the salt having been stored in a damp place. Mr. Richardson is of the opinion that traces of calcium sulphate, ferrous and ferric salts, phenolic bodies, and pyridene do not aggravate caking, but undoubtedly the chief cause is imperfect neutralisation resulting in the presence of free acid. The small amount of acid present, acting as a hygroscopic agent, readily absorbs moisture from the air. The absorbed moisture will then exert a solvent effect upon the surfaces of the crystals and cause them to adhere to one another.

The remedy, of course, suggests itself at once—namely, that producers must ensure that the most careful supervision is given to the neutralising process, for even the slightest irregularities may give rise to considerable variations in the quality and properties of the finished product. It is suggested that large-grained salt is much easier to treat than is the fine crystalline variety, for on account of its open texture it allows the neutralising agent freely and evenly to penetrate the whole mass, so that the process of neutralisation is sooner carried out than is the case with the fine-grained material. Mr. Richardson has laid down a set of useful axioms which sulphate producers would do well to take to heart, and which are well worth repeating here. He says that first of all conditions in the saturator should be adjusted so as to yield large crystals. Second, neutralisation should be thoroughly carried out in a manner which does not destroy the crystals; and, thirdly, the neutral salt should be stored in a dry place, free from draughts, and maintained at an equable temperature.

A Chemist's Questionnaire

THE British Association of Chemists has drawn up a quite comprehensive questionnaire to Parliamentary candidates standing in the present election, and has succeeded in obtaining the assent to all its propositions of a group of each of the three parties. More, perhaps, than a limited response was not to be expected in the hurry in which the contests have been conducted, but the replies constitute a nucleus and may enable the Association to approach other members at a later stage. The proposals constitute so complete a programme that we reproduce them below :—

The re-establishment of a Joint National Industrial Council for all trades and the development of National and District Councils for the individual trades, under the Whitley Scheme. The principal aim of these Councils shall be the betterment of industry and the consequent increase of resources from which all the contributors shall be rewarded for service.

The scientific and technical worker, in virtue of his special contribution to the maintenance and development of industry, to have direct and equal representation on each of the three classes, *i.e.*, National Joint Council, National Trade Council, and District Councils.

In the constitution of all Industrial Councils, that the tripartite system shall be adopted, namely, that the three elements of employer, scientific worker and manual worker shall act in concert on all matters relating to the betterment of the industry, but as regards wages and remuneration these shall be regulated by the employer in conjunction with the particular class of worker concerned.

Scientific workers in Government employment to be paid salaries commensurate with those accorded to officials of corresponding educational status in the other branches of Government services.

No Government or other public service contracts to be given to firms employing chemists at less than the minimum scale of salaries fixed in a constitutional manner by the Association.

In the interests of national efficiency, all chemical departments in the public services to be under the direct control of persons having adequate chemical attainments.

The establishment of a legal distinction between the terms "Chemist" and "Pharmacist."

The establishment of a statutory register of all qualified chemists.

The removal of undue restrictions in the supply and use (under the control of a duly qualified chemist) of duty free

alcohols, ethers and like materials, in works and educational and research institutions.

To secure the safety of the public in general, and employees in particular, by the enactment that certain specified chemical operations shall be under the control of a qualified chemist, and that the inspection of such processes shall be carried out by qualified inspectors, as under the Alkali Works Regulation Acts.

The allocation of adequate public funds for scientific research, provided that the results obtained from research assisted by national grants are open for utilisation for the public benefit.

By reform of the patent laws, to make property in patents more secure, to safeguard the inventor, and to ensure the greatest use of inventions consistent with their commercial development and the due reward of the inventor.

The prevention of any degradation of educational standard and the provision of an educational system in accordance with modern needs.

Reform of the existing Income Tax Regulations so as to ensure that expenses such as subscriptions to scientific societies, purchase of scientific works, damage to and provision of special clothing and the like, being expenses wholly, exclusively and necessarily incurred by chemists in the course of their employment, shall be uniformly allowed as deductions from gross income for assessment purposes.

This looks to us quite a useful contribution towards a national chemical policy, and much, if not all, of it might be accepted almost without demur. It is rather a surprise to find how far the process of defining chemical needs has progressed, and how easy it would be, if all interests acted together, to bring effective pressure to bear on Parliamentary opinion and action.

A Remarkable Shale Deposit

ELSEWHERE in this issue will be found some notes relating to a new process for the extraction of oils from some particularly rich deposits of shale situated in California. Shale, as a medium for oil production, assumes a particularly interesting complexion at the present time, for many are the prophets who foresee that before very long—possibly ten years hence—the present enormous inroads made into existing oil resources by the growth in the world demand for liquid fuels may be followed by the exhaustion of subterranean supplies. Apart from anything which may happen to the present day yielding wells, there would seem to be no question that, in the interests of oil consumers the world over, shale deposits should be exploited in all cases where there are reasonable prospects of marketing the primary and secondary products on a satisfactory commercial basis.

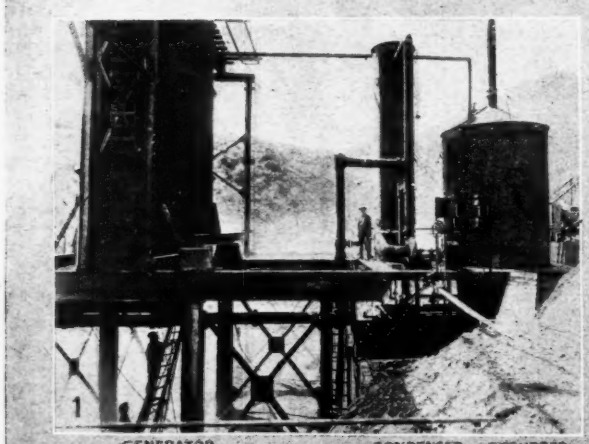
A glance at some of the illustrations given elsewhere of the Californian deposits must immediately suggest regrets that Nature was not more generous when our own shale strata were formed. One is indeed struck by the fact that, whereas in this country we have to dig and delve, in these particular deposits the shale lies, readily accessible, in vast formations above the ground with practically no "overburden." Mining, therefore, is unnecessary, and hence the stumbling-block to so many enterprises is absent. Our readers will note from the description which our contributor gives of the Santa Maria shales of California that on an average they yield approximately 40 gallons of crude oil per ton. This, of course, is well above the average. In operating processes of the kind it is invariably the sulphur bogey to which one's criticisms turn; but in this connection it is encouraging to note that means have been devised for removing the sulphur in the oil.

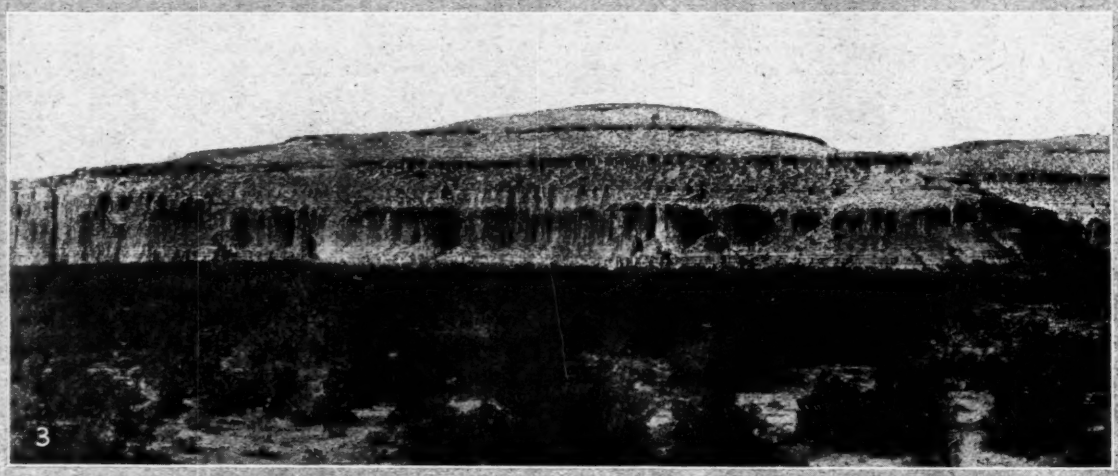
Points from Our News Pages

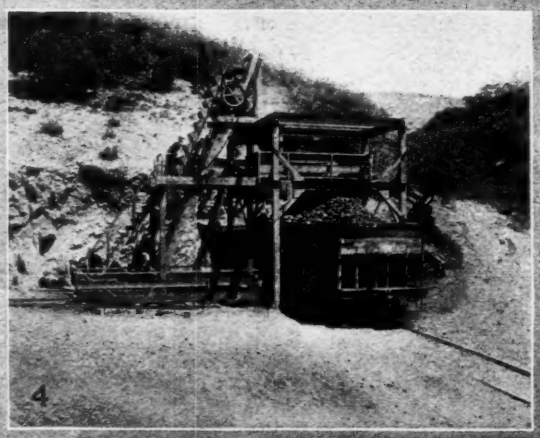
The Calendar

Dec.		
10	Institute of Chemistry: Forty-Sixth Anniversary Dinner. 7 p.m.	Hotel Victoria, London.
10	Institute of Chemistry (Manchester Section): "The Chemist in Relation to Public Life." Mr. F.E.Hamer ("The Chemical Age"). 7 p.m.	Textile Institute, St. Mary's Parsonage, Deansgate, Manchester.
10	Institute of Metals (Scottish Section): "Cold Working of Metals, and its Influence on the Properties and Uses." Mr. A. T. Adam. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
11	Northern Polytechnic Institute Chemical Association: "Sources of Raw Material for Chemical Manufacture." Dr. J. T. Hewitt. 8 p.m.	Holloway, London.
12	Society of Glass Technology. 2.30 p.m.	University College, Gower Street, London.
12	Society of Chemical Industry (Newcastle Section): "The Sterilisation of Preserved Foods." Miss C. M. Dugdale. 7.30 p.m.	Armstrong College, Newcastle.
12	Chemical Engineering Group: Joint meeting with Liverpool Section of the Society of Chemical Industry. "Vegetable Oil Extraction." Mr. J. T. Brewis.	Club Rooms of the Overseas League, 14, Elliot Street, Liverpool.
13	The Society of Dyers and Colourists (London Section): "Colour Solvents and their Application to Textile Fibres." Mr. A. E. Woodhead. 7 p.m.	Dyers' Hall, Dowgate Hill, London, E.C.3.
13	Institute of Metals (London Section): "Some Foundry Problems." Mr. A. H. Mundey. 8 p.m.	The Institute of Marine Engineers, 85-88, The Minories, Tower Hill, E.1.
14	Society of Dyers and Colourists (Manchester Junior Section): "Artificial Silk from the Chemist's View Point." Mr. J. W. Shuttleworth.	Manchester.
14	Institute of Metals (Sheffield Section): "The Metallurgical Microscope—some notes on its construction and use." Mr. J. H. G. Monypenny. 7.30 p.m.	The University, St. George's Square, Sheffield.
15	Chemists' Dinner arranged by the Birmingham and Midland Sections of the Institute of Chemistry and Society of Chemical Industry. 7 p.m.	The Queen's Hotel, Birmingham.
20	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, London, W.1.

Views of N.-T.-U. Co's Shale Oil Extraction Plant at Santa Maria, California







1.—General Arrangement of New 40-ton Plant facing the U.S.A. Naval Shale Reserve of 100,000 acres. 2.—General View of Plant. 3.—Section of the N.-T.-U. Co.'s Shale Lands at Work, charging 40-ton truck. 4.—Bucket Conveyor and Crusher 5.—Entrance to Works from Santa Maria.

Extraction of Oil from Shale

Some Notes on a New Process

The following article by Mr. G. W. Wallace, consulting engineer, deals with a process in operation in California for the extraction of oil from shale. The essential question of cost is dealt with in a report by Smith, Emery and Co. Views are published on the opposite page of the shale deposit and of the plant. In case of possible inquiries it may be well to add that the address of the N-T-U Co. (referred to in the article) is 40, Grosvenor Place, London, S.W.1.

MANY eminent geologists and petroleum engineers agree, and have so stated in various publications, that the supply of oil from wells will shortly be greatly decreased. They have also predicted that within a limited time it will be virtually exhausted, while the need of oil must inevitably and constantly increase. It would, therefore, seem to be very important that the industrial interests should know of the definite progress which has been made with the extraction of oil from shale, as the deposits of oil-shale in many parts of the world are unlimited.

The N-T-U Company, of Delaware, on its leased oil-shale property in California, U.S.A., built a 20-ton shale oil generator of an entirely new type and put it into operation during the latter part of June, 1922, since which date it has been successfully operating day and night. So eminently satisfactory were the results obtained with this 20-ton unit that a unit of 40 tons' capacity, constructed on exactly the same principles, was built and put into operation in July, 1923, and since that date has operated 89 per cent. efficient from an oil recovery standpoint. This oil is of a quality that finds a ready market for a special purpose at very profitable prices. The new 40-ton unit has been standardised, and is the first unit of a 1,000-ton plant which will be erected at once.

The merit of any process for extracting a marketable oil from shale must eventually be determined by the capital cost of its plant, by the cost of its maintenance, and by the cost of its production, because if these costs are abnormally heavy the commercial success of a shale oil company would be in the gravest danger.

Plans and specifications for a 1,000-ton daily capacity plant of the 40-ton type now in operation have been placed by the N-T-U Company before a large and thoroughly responsible manufacturing company. This company has given a dependable estimate of construction costs which is well within $400,000.

The design of this new 1,000-ton plant calls for no moving or working parts within the units, therefore maintenance costs are very small. Wherever possible, manual labour has been replaced with electrically operated equipment, resulting in low operating costs.

While the N-T-U Company had its own records of cost of production over a long period of continuous operation, they considered it desirable to have the production costs of their 40-ton plant certified to by a qualified engineering firm of unquestioned ability and character, having no interest whatsoever in the N-T-U Company. To this end they secured the services of the widely known engineering firm of Smith, Emery & Co., of San Francisco. With the exception of three paragraphs that deal with certain important construction features of the generator, their full report is as follows :—

Report on Operation Costs

At the request of the N-T-U Company our Mr. G. L. McCreery, assisted by Mr. Albert E. Neu, on August 21, 1923, visited the 40-ton test unit of the N-T-U Company at Santa Maria, California, for the purpose of observing the cycle of operation in their process of separating oil from shale, and to collect data upon which our estimate for operating costs of a 1,000 ton installation is based.

The installed 40 ton generator is designed to become a part of a 1,000 ton installation which will consist of 26 similar generators. The other units of the system, such as crushers, tracks, etc., have been laid out with reference to the eventual development of the plant, and will fit in readily with future construction.

The shale deposit is a massive formation (in reality an oil saturated shale and not a petro-shale), which occurs as a large rounded hill covered by an overburden of loose rock and soil from 10 to 15 ft. in thickness. The quarry development has a face of about 60 ft. in width and height, and enters the hill as an open cut about 100 ft. in length.

The shale is moved by gravity over a 5 per cent. grade from the quarry face to the crushers and thence to the generator. The maximum height of the quarry face at the present floor level will be 240 ft.

It should be noted that :—The shale itself furnishes the fuel for this process ; there is no external heating required ; the only moving part during distillation is the suction fan which handles the cooled gases from the condenser ; the grate and its moving mechanism are not subject to excessive heat nor to wear by abrasion from the shale.

In observing the test-run 18, made on August 21 and 22, a careful check was made of the labour and time required for each step of the operation from mining to the removal of the spent shale. A considerable portion of the work is at present being carried on by hand, as the nature of the material and the problems to be met in machine operation were undetermined factors until the process was in actual operation and a first-hand study made.

The figures given in the following table include only the labour directly charged to a single operative cycle. It is not intended to represent the total cost of operation for the experimental unit and does not include any allowance for supervision, maintenance, office expense, interest, etc.

LABOUR COSTS DIRECTLY CHARGEABLE TO RUN NO. 18 N-T-U GENERATOR, SANTA MARIA, AUGUST 21–22, 1923, REPRESENTING ONE CHARGE OF 38·5 TONS.

	Men.	Time.	Man-hours.	Rate.	Total.	Cost per ton
				$	$	$
Mining	5	1·5 hrs.	7·5	0.55	4.125	0.1071
Crushing	5	3·0 hrs.	15·0	0.55	8.250	0.2143
Transportation	6	6 min.	0·6	0.55	0.330	0.0085
Charging	3	33 min.	1·65	0.55	0.908	0.0236
Generator operation	3	8 hrs.	24·0	5.00 (day)	15.000	0.3896
Discharging	1	40 min.	⅔	0.55	0.366	0.0095
Spent shale disposal	2	6⅓ hrs.	12⅔	0.55	6.966	0.1809
Total labour charge					$35.945	$0.9335
Power (lights, pump, blower, crusher, winch), 295·6 kilowatt-hours at 2 cents					5.912	0.1536
Total direct charges					$41.857	$1.0871

Mining was conducted entirely by hand. The shale was drilled, blasted, and broken up with picks, shovelled into mine cars, and hand-pushed to the crusher. The crusher is motor driven, and ran idle two-thirds of the time operated, indicating a capacity of about 40 tons per hour. From the crusher the shale ran into an ore car holding a 40 ton charge. The loaded car attached to a cable on a winch was run down a quarter-mile track with a 5 per cent. grade and stopped over the top of the generator. The load was then dumped directly into the generator and the distillation started as described above. A

better system of brake control and an alteration in the design of the ore car are now being installed. These improvements will materially reduce the number of men required for the items of transportation and charging.

There was one generator operator on duty for each eight-hour shift, making three men for each charge (on the basis of 24 hours per charge). Discharging required one man to help the generator operator in quenching the hot shale as it leaves the generator. Spent shale was disposed of by two men breaking up the clinker by hand and removing it with wheel-barrows. The power costs represent the meter reading over the 24-hour period required for this run. The power used by the water pump was in excess of the daily requirement, since almost double the daily supply was produced. Samples were taken from the charge of shale, the oil recovered, and the flue gases. These were subject to laboratory tests, with the following results :—

ASSAY (Shale from charge 18).

Oil content .....17·77 per cent. = 1·0323 bbls. (42 gal.) per ton of shale.

RECOVERED ON RUN 18 (Charge 38·5 tons).

Oil (moisture free).....35·64 bbls. ; 0·926 bbl./ton.
Percentage of oil recovered (based on assay)....89·7 per cent.

Tests on the oil showed it to be high in aromatic and sulphur compounds with a low viscosity. A few of the constants are as follows :—

Specific gravity at $\frac{60° \text{ F.}}{60° \text{ F.}}$ ..... ·984
Baumé (Bureau of Standards) ..... 12·3°
Tops distilling below 425° F. (36·7° Bé.)..... 0·8 per cent.

The crude oil is proving particularly useful as a flotation oil, and it yields readily to standard cracking processes.

A cracking test made on the crude oil and carried to coke gave 63·5 per cent. of distillate (32·5° Bé.), which yielded the following tops on a straight run redistillation :—

	Per cent. based on crude oil.
Initial boiling point	122° F.
Oil distilling below 425° F.....	30 per cent.
Specific gravity at $\frac{60° \text{ F.}}{60° \text{ F.}}$	·805
Baumé (Bureau of Standards)	43·9°

The crude oil yielded 15 per cent. to 16 per cent. of refined gasoline. The remaining portion of the cracked oil is amenable to further treatment, but our work has not progressed far enough to make definite statements.

The uncondensable flue gas, a part of which is returned to the generator, was sampled before and after passing through the scrubber. The following analyses were obtained :—

FLUE GAS ANALYSES.

	9 p.m., August 21. Before Scrubber.	11 a.m., August 22. After Scrubber.
	Per cent.	Per cent.
Carbon dioxide (CO_2)....	7·8	7·6
Heavy hydrocarbons (ethylene, etc.)	0·9	0·2
Oxygen (O_2)	3·9	3·8
Carbon monoxide (CO) ..	10·5	13·5
Methane (CH_4)	3·6	3·6
Hydrogen (H)	4·6	6·3
Nitrogen (N)	68·7	65·0
	Per cubic foot.	Per cubic foot.
B.T.U.	103·90	107·62

It will be noted that this gas is equivalent to a low heat producer gas and is fairly constant in composition. Approximately 20,000 cu. ft. per ton are available in addition to the gas returned to the condenser. This will provide a considerable fuel for dehydrating and cracking of the crude oil.

On studying the question of production on a 1,000 ton daily schedule it is evident that machine work should be substituted for hand labour in the items of mining, crushing and spent shale disposal, which constitute 53·7 per cent. of the direct labour charge on the experimental unit.

Ample electric power is available on the property at 11,000 volts, 3 phase, 60 cycle ; hence our estimates for power requirements are based on electric operation of the machinery.

1,000 TON PLANT.

In mining this material we consider that the over-burden may be stripped by electric shovel and the shale shot down by blasting. Power drills to be used for drilling and breaking rock ; two shovels, each having a capacity of 60 cu. yds. per hour, to be employed for stripping and loading cars as required. This material weighs from 40 to 45 lbs. per cu. ft., and while one shovel if pushed could supply 1,000 tons in two eight-hour shifts, it is our opinion that the mining and crushing equipment should be of ample oversize to insure against breakdowns. For the same reason the crushing and conveying machinery should be well oversize.

Our estimate of cost of operation for a 1,000 ton plant is based on our observation and knowledge of mining and distillation operations :—

MINING
(Two shifts of 8 hours each).

Operation of two shovels, including :—	$
4 Operators at $6.80 4 Pitmen at $4.40 Power, repairs and maintenance of shovel	94.00
Air drill operators, 4 at $4.40	17.60
Labourers, 4 at $3.50	14.00
Blasting powder and dynamite	5.00
	$130.60

CRUSHING AND LOADING 40 TON CARS
(Two shifts of 8 hours each).

	$
Power, 250 kWh at 2 cents	5.00
Operators, 2 at $5.00	10.00
Labourers, 2 at $3.50	7.00
	$22.00

TRANSPORTATION
(Two shifts of 8 hours each).

Power for winch (return of empty cars from generators) :—	$
125 kWh at 2 cents.....	2.50
Winch operators, 2 at $5.00.....	10.00
(Labourer drawn from crusher operation as needed)	
	$12.50

CHARGING
(Two shifts of 8 hours each).

Labourers, 4 at $4.00	$16.00

GENERATOR OPERATION
(Three shifts of 8 hours each).

NOTE.—The generators in the 1,000 ton plant are designed in pairs, making in all 13 sets. The blowers or fans will be centrally located in a detached building, together with the condensers and scrubbers. Each generator may be connected with or detached from the suction lines independently without interrupting the motors or other units. Hence the motors, condensers and scrubbers will be centrally controlled by one operator and the generators by a second operator. A foreman will have general charge of the generator system on each shift, and the operators will be assisted by the labourers allocated to "charging" and "discharging." All repairs and adjustments of equipment to be cared for by the master mechanic's crew or the electrician's crew.

	$
Generator operators, 6 at $5.00.....	30.00
Labourers (to assist operators on 3rd shift, 2 at $4.00)	8.00
Power, 5,200 kWh at 2 c.	104.00
	$142.00

DISCHARGING AND SPENT SHALE DISPOSAL
(Two shifts of 8 hours).

	$
Discharging motors, 125 kWh at 2 cents.....	2.50
Electric car loading machine, 1,200 kWh at 2 cents.	24.00
Loading machine operators, 2 at $6.80	13.60
Labourers, 4 at $4.40	17.60
Winch (hauling spent shale), 275 kWh at 2 cents....	5.50
Winch operators, 2 at $5.00.....	10.00
Labourers, 6 at $4.00	24.00
	$97.20

SUPERVISION AND OVERHEAD
(Per day).

	$
Superintendent	10.00
Foremen, mining and outside labour—2 at $7.00	14.00
Foremen, generator system—2 at $7.00	14.00
Electrician	7.00
Electrician helpers—2 at $5.00	10.00
Master mechanic	7.00
Mechanic helpers—2 at $5.00	10.00
Machinist	5.50
Blacksmith	5.50
Pump man	5.00
Clerk—1 at $135 per month	4.50
Watchman—1 at $100 per month	3.33
Chemist—1 at $180 per month	6.00
Sampler and tank gauger	4.00
Truck driver (supplies, etc.)	4.00
Storekeeper	5.00
Carpenter	6.60
General maintenance gang—6 men at $4.50	27.00
	$148.43

PUMPS, LIGHTS AND DEHYDRATION.

	$
Water pumps, 1,300 kWh at 2 cents	26.00
Electric lights, 625 kWh at 2 cents	12.50
Dehydrating of oil	20.00
	$58.50

SUMMARY OF OPERATING COSTS, 1,000 TON PLANT.

	Total per 1,000 tons. $	Cost per ton. $
Mining	130.60	0.1306
Crushing	22.00	0.0220
Transportation	12.50	0.0125
Charging	16.00	0.0160
Generator operation	142.00	0.1420
Discharging and spent shale disposal	97.20	0.0972
Pumps, lights and dehydration	58.50	0.0585
Extra allowance for supplies, maintenance, labour, etc.	100.00	0.1000
Supervision and overhead	148.43	0.1484
	$727.23	$0.7272

This estimate is exclusive of interest, depreciation, insurance, taxes, general office, shipping and selling expense.

SMITH, EMERY AND CO.,
Engineers-Chemists.

It will be noted in Smith, Emery and Co.'s report that the actual cost of production, excluding overhead, was $1.09 per ton, and that the estimated cost of operating the 1,000-ton plant, including overhead, is 73 cents per ton.

The oil content of the shale on the N-T-U Company's Californian property is something more than a barrel per ton, and of this 89 per cent. is recovered, so that the cost of production per ton is also approximately the cost of production per barrel of oil.

The costs submitted in the Smith Emery report have been fully confirmed by a noted engineer, selected and employed by one of the important banking houses in America to make a full report on this project. While his report is very gratifying to the company, it is a confidential report and cannot be published. This engineer spent three weeks investigating and studying the operation of the present 40-ton unit. A few of his conclusions will be of interest :—Primarily, the costs of operating a 1,000-ton plant of this type, divided as follows :—

	$
Plant operation, per ton	0.437
Mining " "	0.141
General overhead, " "	0.109
Total " "	0.687

In concluding his report, he stated, "that the process was very satisfactory; was fundamentally sound and simple to operate, and will undoubtedly produce a uniform quality of crude oil cheaply."

It should be carefully noted that the mining costs of the N-T-U Company's shale are but fourteen cents per ton, by reason of their shale being in cliff formation above the earth surface and with but very little intervention of other rock or clays.

Those who control shale properties are naturally looking for a process, adapted to the successful extraction of oil from any class of shale, by which the oil may be recovered at moderate price; a process wherein the low expense of plant construction and operation, combined with low maintenance charges, results in production costs low enough to permit competition with ground oil; a process which produces shale oil of such a quality that it may be refined and marketed without difficulty at a substantial profit. That the N-T-U Company has accomplished the development of such a process is certified to by the Smith, Emery Co. in their report.

G. W. WALLACE.

Recent Advances in Colloid Chemistry

Paper by Mr. A. V. Slater

A LECTURE on "Recent Advances in Colloid Chemistry," was given by Mr. A. V. Slater (of the Research Laboratory of Reckitt and Sons, Ltd., Hull) on Tuesday, November 27, to members of the Hull Chemical and Engineering Society.

A brief introduction dwelling on the importance of colloid chemistry in industry was followed by a review of recent theoretical advance. The nature of surfaces considered in the light of Hardy, Langmuir and Harkins researches was governed by (1) Orientation of Molecules and (2) Residual Valency, which could explain many of the anomalies of surface tension and interfacial phenomena, and therefore of colloidal behaviour. Sir William Bragg considered that the colloid was built up in the same way as the crystal, and only differed because the surface molecules had not slipped into their proper places, and this was further borne out by von Weimarn's work, which was briefly summarised thus: The environment of the separating phase determined its crystalline or colloidal condition. The evidence brought forward by Hardy, McBain, Pauli and Loeb for the existence of an ionic micelle or colloidal electrolyte as the colloid unit was briefly presented, and the lecturer expressed his own view that the theory of colloids could be explained satisfactorily neither by the purely chemical nor by the physical adsorption concept, but that a correlation of the two by the light of recent research on surfaces and interfaces was necessary.

The most recent developments in industry were reviewed and illustrated by charts and experiments. Formation of colloids: colloidal fuel, Goldschmidt Akt. Ges., Plauson Mill; separation of colloids: stream line filter; adsorption: catalysis, silica gel, dust explosions, deinking paper, flotation; wetting: Liquid sprayers, insecticides; flocculation and deflocculation: clay refining, de-emulsification of water, rubber latex; endosmosis: tanning and gelatine, clay and peat; protection: Newton Friend's expt., Alexander, animal fibres.

The stream line filter is affording much speculation and its development is being watched with interest. Silicia gel as an absorbent has many possibilities. Into two glass jars filled with benzol vapour, one containing silica gel, a lighted taper was thrust. The explosive combustion of the one and the total absence of flame in the other afforded a striking instance of the completeness of adsorption.

The chair was taken by Mr. H. A. Scruton, B.Sc., F.I.C. A vote of thanks was passed on the motion of Mr. A. R. Tankard, F.I.C., seconded by Mr. Howard Thompson.

Retirement of Professor Dunstan

THE retirement is announced of Professor Wyndham Dunstan, director of the Imperial Institute. He has occupied the position for 20 years, prior to which he had been secretary of the Chemical Society and Professor of Chemistry at St Thomas's Hospital.

The Stream-Line Filter

To the Editor of THE CHEMICAL AGE.

SIR,—One hardly knows whether to take the article on the Stream-Line Filter, written by "Randy," seriously or otherwise.

Careful study of the article shows that there is practically no serious criticism of the filter itself. I say this after careful reading, as I have been using one of these filters for laboratory purposes almost from the beginning, and have not found, up to the present, that it fails to do any of the remarkable things which it has been reported to do.

I know, of course, nothing about its application on a commercial scale, and time alone can show to what extent it will come into general use in the manufacturing arts. That will lie rather on the engineering side, but from the remarks of the writer in this and previous articles no good thing is possible from an engineer, chemical or otherwise.

One new aspect of the filter is the satisfactory treatment, by a new and special paper, of strongly alkaline liquids—an operation which, up to the present, has never been possible on any commercial scale.

Although there is no serious criticism, or even attempt at criticism of the filter itself, it is rather regrettable that the headlines of the article (doubtless only intended to be humorous) may convey a false impression of the real views which your correspondent "Randy," and even you yourself, may hold.—Yours, etc.,

J. A. PICKARD, A.R.C.S., B.Sc., F.I.C.

21, Rosemont Road, Acton, W.

December 4.

[We are glad to publish the above letter, as it gives us an opportunity of removing any impression that the article referred to was intended to be unfavourable to the Stream-Line Filter, and of adding, quite frankly, that some of our readers regard certain allusions to its distinguished inventor—though no doubt quite innocent—as a little lacking in grace. Dr. Hele-Shaw himself is much too well known and too good a sportsman to be perturbed by these references, but we think it due to him to make this statement; in any case his personality has nothing to do with the Stream-Line Filter. As Mr. Pickard says, the article itself passed no destructive criticism whatever on the filter, and there is ample evidence already made public of the belief of experts in the great industrial future of the invention. We hope shortly to publish an account of some further developments in connection with the Stream-Line Filter which should tend to confirm this belief.—ED. *C.A.*]

Chemists and the Election

To the Editor of THE CHEMICAL AGE.

SIR,—Once again the British Association of Chemists has taken the opportunity of placing before the candidates for election a questionaire covering matters affecting vitally the welfare of the chemists of the country. For the benefit of your readers a copy is attached hereto.

Replies have, so far, been received from over 20 per cent. of the candidates, and among the large number of replies (over 90 per cent.) in support of our programme are to be found the following:—

Conservative.—Rt. Hon. L. C. S. Amery (1st Lord of the Admiralty); Rt. Hon. Sir Douglas Hogg (Attorney General); Sir F. Sykes; Sir P. Sassoon; Mr. C. S. Garland.

Liberal.—Mr. E. Brotherton-Ratcliffe; Cmdr. Kenworthy; Rt. Hon. J. M. Hogge; F. Briant, L.C.C.

Labour.—Rt. Hon. A. Henderson; W. Thorne; G. Lansbury; H. G. Wells; C. W. Bowerman; E. G. Hemmered.

Considering the strenuous conditions under which candidates live at election times, and especially the more prominent ones, we consider the response to our questionaire extremely satisfactory.—Yours, etc.,

I. BOODSON.

British Association of Chemists,
Bedford House,
108, Baker Street, W.1.

[This matter is referred to in our Editorial Notes.—ED. *C. A.*]

Transport of Dangerous Chemicals

To the Editor of THE CHEMICAL AGE.

SIR,—From time to time the non-technical Press supplies, in all good faith, misleading information, and I fear that it is seldom possible to catch up with items of news which are widely circulated and which contain statements of dubious accuracy.

A paragraph recently circulated and quoted by the technical Press refers to a violent explosion which set fire to and sank the British steamer *Otterburn*. The paragraph concludes by saying that the disaster was thought to be due to the explosion of barrels of chlorate of potash. I am informed, on what appears to be quite good authority, that there was no chlorate of potash on board the ship, but that there was a parcel of chloride of potassium.

The transport of dangerous substances is always a matter of difficulty, and it is therefore desirous that one should not unwittingly increase the difficulties by blaming a dangerous substance unnecessarily. To weigh down the statistics of explosions due to chlorate of potash by such items of news as that to which I refer would be misleading, and prejudicial to those firms who have to send abroad such goods.—Yours, etc.

W. J. WOOLCOCK,
General Manager,
Association of British Chemical Manufacturers.

166, Piccadilly, W.1.

Chemical Engineering Conference in Liverpool

To the Editor of THE CHEMICAL AGE.

SIR,—A joint meeting of the Chemical Engineering Group of the Society of Chemical Industry and the Liverpool Section of the Society will be held at the Club Rooms of the Overseas League, 14, Elliot Street, Liverpool, on Wednesday, December 12, 1923, when Mr. J. T. Brewis will read a paper on "Extractions of Oils from Seeds, Nuts and Kernels," and the following programme has been arranged:—

By kind permission of the directors of the African Oil Mills (Co-operative Wholesale Society), Flint Street, Liverpool, arrangements have been made for a visit to these mills, and the Hon. Secretary of the Liverpool Section of the Society has arranged the following programme on the date in question:

2.15 p.m.—All members wishing to visit the African Oil Mills to assemble at the City Analyst's Department, City Laboratories, Mount Pleasant, Liverpool, prior to visiting the mills in question, which are situate in Flint Street.

2.30 p.m.—Visit to the mills.

5.30 p.m.—Afternoon tea at the Club Rooms of the Overseas League, 14, Elliot Street, Liverpool.

6.0 p.m.—Meeting for the reading of Mr. Brewis's paper.

7.45 p.m. for 8.0 p.m.—Informal dinner at the University Club, Mount Pleasant, Liverpool (tickets 5s., exclusive of wines).

I should be extremely obliged if you would give due notice of this very important meeting in your valuable Journal, and oblige.—Yours, etc.

H. TALBOT,
Honorary Secretary.

Abbey House, Victoria Street, S.W.1.

U.S.A. Exposition of Chemical Industries

To the Editor of THE CHEMICAL AGE.

SIR,—It has been suggested to us that since your country men will have a larger interest in the next Exposition they would be glad to learn something of its plans and progress.

Nine very successful expositions have already been held annually, and the industry here has now reached a stage where it was thought advisable to forgo an exposition in 1924. It was decided to hold the next or Tenth Chemical Industries Exposition in 1925.

During the past six years the Exposition has averaged about 400 exhibitors, and during the entire period the attendance has grown from 63,000 to 127,000. At the last—the Ninth Exposition—an attendance of 83,000 visitors was recorded. A programme of speakers, society meetings, and motion pictures is regularly a part of the Exposition. This past year a new feature was introduced: the Students' Course in Chemical Engineering. A general programme and a

Students' programme for the last exposition are enclosed for your perusal.

Each month we shall issue news items concerning the progress of the Exposition, and shall take pleasure in sending copies to you since they will contain news which we believe will interest your readers. If you find them of use for printing or for comment in your esteemed publication we shall greatly appreciate your courtesy. The first preliminary announcement for the 1925 Exposition is enclosed.—Yours, etc.,

CHARLES F. ROTH,
Grand Central Palace, New York. Manager.

Plans for the 1925 Exposition

From the particulars enclosed it appears that all space on the main floor of the Grand Central Palace, New York, available for the Tenth Exposition of Chemical Industries, to be held in 1925 during the week of September 28 to October 3, has been contracted for by former exhibitors. About fifty per cent. of the space on the second floor has been taken, chiefly by chemical and dyestuff manufacturers. Contracts for third floor space have been signed by a number of firms which prefer this location. All told, early contracts indicate that the 1925 Exposition will be considerably larger than that which was held this year at the Grand Central Palace. If expected plans are carried out by a number of firms which were not in the 1923 Exposition, an additional floor in the Palace may be needed to house the 1925 Exposition.

The immediate success which was won by the course in the fundamentals of chemical engineering practice held this year at the Exposition for students from American universities all over the country, has decided the management materially to expand this phase of the Exposition in 1925. In view of the fact that the college student of to-day is the buyer of chemicals and equipment of to-morrow, thoughtful exhibitors believe that the Students' Course helps goodwill and future sales promotion for every exhibitor. With a view to focussing industrial and financial eyes on the American industry generally, and more particularly on the developments which may occur during the next two years, the educational exhibits will be expanded to cover a broader field within the industry. While the sessions of the Students' Course this year had an average attendance of some two hundred, it is planned by work among the colleges and changing the date of the Exposition to after the opening of the universities, to double or treble this attendance in 1925.

Another progressive step which drew favourable comment from many quarters this year, and which it is planned to carry out again in 1925, was the more restricted distribution of tickets. By co-operation between management and exhibitors, planned at a meeting of exhibitors in June, 1923, careful sending out of tickets cut down the attendance of the 1923 Exposition to some 83,000 as compared with 120,000 in 1922. The proportion of disinterested wanderers was thus minimised to the satisfaction of all exhibitors. The attendance cut of thirty per cent. is noteworthy when it is realised that not fewer than 100,000 persons have attended any Chemical Exposition for five years prior to 1923. In view of the success this year of the plan, further ticket restrictions are looked for in 1925, although every exhibitor will be supplied with all the admissions which can be judiciously used.

Retirement of Mr. Alex. Fraser

WE are advised of the retirement of Mr. Alex. Fraser, who has been actively connected with the heavy chemical industry as a process worker, and subsequently as a foreman, since 1869. Mr. Fraser first started work at chemical works in the Widnes district. Subsequently he was foreman at Norris's, of Sowerby Bridge, and acted in a similar capacity at Dan Dawson and Sons, of Milnsbridge; Read, Holliday and Sons, Ltd., of Huddersfield; and J. Brown and Co., Ltd., of Dewsbury, and for the last ten years has been with the West Norfolk Farmers' Chemical Manure Co., Ltd., of King's Lynn. Always shrewd, and with an intuitive knowledge of the requirements of the heavy chemical trade in the matter of the erection of plant, and its subsequent operation, he has been peculiarly successful, and has done excellent work for the many firms with whom he has been associated during the last fifty years. It need hardly be said that Mr. Fraser, who is seventy-four years of age, carries with him the good wishes and esteem of many friends in his well-merited retirement.

Chemistry of Rubber

The Society of Chemical Industry: Birmingham Section

QUESTIONS relating to the chemistry of rubber were discussed by the members of the Birmingham and Midland Section of the Society of Chemical Industry at the second meeting of the session, at the University of Birmingham, on Tuesday, November 27. Dr. E. B. Maxted presided.

The first paper was "The Acceleration of Vulcanisation by Xanthate and the Influence of Metallic Oxides as Promoters," by Dr. D. F. Twiss and Mr. F. Thomas. In this it was stated that no record has yet been made in the chemical literature of the characteristic features of vulcanisation with the aid of metallic xanthates. The activity of the zinc alkylxanthates is greatly influenced by the presence of a suitable metallic oxide, such as zinc oxide. At ordinary vulcanising temperatures, such as 148° C., vulcanisation in the presence of a zinc alkylxanthate gives no clear indication of anything exceptional. Below 130° C., however, vulcanisation is greatly expedited, the improvement being most noticeable in the presence of zinc oxide, as little as 1 per cent. sufficing for a striking improvement in the physical properties of the product.

A mixture of rubber 90, sulphur 10, vulcanised at 148° C. required 110 minutes for the attainment of an elongation (at 0·5 kgs./sq. mm.) of 650 per cent., or a tensile strength of approximately 1·7 kgs./sq. mm. Progressive vulcanisation in this case is attended by the normal rapid decrease in extensibility and the development of a maximum in the tensile strength. With the additional presence of 5 per cent. of zinc ethylxanthate and 1 per cent. of zinc oxide in a mixture of the same rubber and sulphur (95 : 5) at 98° C., a tensile strength exceeding 2 kgs./sq. mm. and an elongation of 486 per cent. at a load of 0·5 kgs./sq. mm. are attained in less than 20 minutes and remained substantially unaltered even after an extension of the period to 150 minutes. In spite of the presence of a considerable residue of free sulphur, the degree of vulcanisation remains stationary over this period. The zinc salts of the other alkylxanthic acids possess similar power.

Consideration of numerous results leads to the view that the alkylxanthate under the conditions of vulcanisation specified enters into two types of chemical reaction. In one of these a rapid cyclic set of changes occurs with activation of sulphur. In the other the xanthate undergoes irreversible decomposition with consequent rapid reduction in the quantity of xanthate available for the former reaction. With the aid of zinc xanthate and similar accelerators it has been possible to compare the relative vulcanising power of soluble sulphur ($S\lambda$) and insoluble sulphur ($S\mu$) at temperatures as low as 88° C., *i.e.*, below the melting point of sulphur. The results confirm the earlier evidence as to the surprisingly little difference observable between the effect with these two forms of sulphur; the range of temperatures over which such comparison has now been made is from 88° C. to 188° C.

The second paper, by Dr. Twiss and Mr. F. B. Jones, was on "An Important Variable in Raw Rubber." It was stated in this paper that various physical characteristics have been applied as a basis for the comparison of various grades of rubber. Dr. O. de Vries in a recent paper stated that "tensile strength and rate of cure" may be determined by one appropriate cure or at the most two (a trial and final vulcanisation). Making a series of cures with one mix is only useful to determine the "broadness of peak," the way in which the tensile strength changes with over cure. Now this broadness of peak is certainly a most important property in the study of different compounds. Perhaps it may also be of importance when comparing the different types of rubber, for instance, plantation with hard fine para, since for the latter a broader peak is claimed. But there are no indications that ordinary plantation crepes or smoked sheets differ considerably in broadness of peak. Experimental results were described showing that the possibility adumbrated in the preceding statement is actually a fact.

Bequests to Sheffield University

THE late Sir Albert John Hobson, LL.D., of Sheffield, who was a director of several metallurgical firms, left in his will a number of bequests to Sheffield University, including a promised gift of £5,000, the total of residuary and reversionary interests of the University amounting to £100,000.

Organic Compounds as Rubber Vulcanising Accelerators

Major Lefebure on Recent Developments

In a lecture on "Rubber Vulcanising Accelerators," before the Institution of the Rubber Industry, in London, on Monday, Major V. Lefebure, of the British Dyestuffs Corporation, considered the properties of different products in actual manufacture and use as accelerators.

Discussing the great extension of the use of organic products for accelerating vulcanisation since 1912, he said that to-day more than 2,000 tons of synthetic organic chemicals are used annually, and 200,000 tons was a moderate estimate of the amount of rubber mix now vulcanised by means of these products. Dealing with accelerators as chemicals, he said that one of the most important requirements of any material added to the rubber mix was that it should be constant in its action. Therefore, it must be uniform in composition and physical nature. For the organic accelerator, this meant that it must be of constant *chemical* composition, and how could the rubber manufacturer be assured of this unless he knew that composition? The frank disclosure of the nature of the chemical was the only guarantee of any value to the rubber manufacturer, and such disclosure could not be made without the use of the chemical names. An accelerator bearing, for instance, a particular number or letter might vary in actual composition or in purity without the rubber manufacturer detecting the change until he struck some serious difficulty. Therefore, he deprecated offering accelerators under curious trade names. For example, about six months ago samples of diphenylguanidine were collected from all possible sources and examined, and were found to vary greatly as regards method of sale and quality of the product. The products, most of which were sold under trade names, varied in actual diphenylguanidine content from 97 to 86 per cent., but in this case the British-made product was at the top of the list.

Speed of Various Accelerators

Comparing various accelerators from the point of view of speed, Major Lefebure referred to work carried out by various investigators, and made the following comparisons:—3 per cent. of thiocarbanilide at 138° C. reached maximum tensile (mix: rubber 90, sulphur 10) in about 180 minutes, whereas ¼ per cent. of *p*-nitrosodimethylaniline at the same temperature required somewhat less than 80 minutes. From this we got a cross comparison with aldehyde ammonia, ¼ per cent. at the same temperature requiring about 80 minutes to reach the same condition of cure.

His firm had made experiments with pure gum stock and as a result the following quantities of accelerators were found roughly equivalent in activity:—

Accelerator.	Parts.
p-Nitrosodimethylaniline	1
Diphenylguanidine	1½
Aldehyde ammonia	1½
Triphenylguanidine	4½
Hexamethylenetetramine	4½
Thiocarbanilide	8–10
Tetramethylthiuramdisulphide	less than ½

Substances Influencing Accelerators

Passing to the behaviour of accelerators in the presence of zinc oxide, which is a matter of great practical importance, Major Lefebure again made comparisons and drew conclusions from published work and also gave his own experiences. These showed that the presence of zinc oxide did have an important influence on the behaviour of organic accelerators. There were other ingredients of the mix, besides zinc oxide, which also exerted an important influence in this respect. Magnesium carbonate seemed to exert a mild activating influence on most accelerators, but he had not found it to behave in any specific manner in any special product. High percentages of litharge seemed to reduce the speed of organic accelerators, but it was inconsistent, in the majority of cases, to employ high percentages of this product in the presence of such accelerators. White substitute was an interesting case, as it seemed to be a violent enemy of most accelerators.

Owing to the great interest of *p*-nitrosodimethylaniline as an all-round accelerator, the lecturer referred to its so-called iharmful effects. Although some firms were using *p*-nitrosodimethylaniline and hexamethylenetetramine continuously without any rash trouble, yet attempts had been made from time to time to obtain combinations giving all the advantages of the *p*-nitrosodimethylaniline accelerator without the incidental disadvantages. The most recent appeared very promising, and consisted in making molecular compounds with β-naphthol and other analogous products. These compounds possessed a greater activity than their actual *p*-nitrosodimethylaniline content would justify, and appeared to be almost entirely free from the main disadvantages referred to.

All the work published, coupled with the tests carried out by the British Dyestuffs Corporation, enabled a list to be made of comparative activities of the commercial accelerators in order as follows: *p*-Nitrosodimethylaniline; Diphenylguanidine; Aldehyde Ammonia; *p*-Phenylenediamine; Hexamethylenetetramine; Triphenylguanidine; Zinc sulphate- mmonia compounds; Formaldehyde-aniline; Thiocarbanilide. This list omitted the so-called "super-accelerators," the dithiocarbamates and thiuramdisulphides, as they were a special type.

The Question of Stability

As to the comparative merits of accelerators from the point of view of milling and stability, Major Lefebure said, regarding their stability as chemicals in transit and in the drug room, his experience was that practically all the products mentioned as standard commercial accelerators could be regarded as stable, with the qualification that pure, highly active and valuable products of this sort should always receive careful handling and adequate protection in the drug room. There was one marked exception, namely, the zinc-sulphate-ammonia compounds which had recently come on to the market, which would be quoted as typical representatives of relatively unstable compounds. Stability on the mills was a more searching test, as temperatures there sometimes reached well over 80°, and his experience was that the accelerators which had shown the greatest stability—in fact, complete stability—under the most stringent milling conditions were the guanidines and *p*-nitrosodimethylaniline.

As to the ageing influence of new rubber processes or new ingredients of the mix, Major Lefebure said that from the bulk experience of a large number of rubber manufacturers over a long period of time only one conclusion was possible, namely, that the proper use of accelerators not only did not harm ageing, but had run parallel with the improved ageing of a number of important lines of rubber goods.

With regard to super-accelerators, the earliest products to be suggested and tested were the thiocarbamates, which, as straight chemicals for introduction into rubber mixes, and for storage as chemicals and in rubber stock, had certain disadvantages. In general, they were fairly deliquescent, and, if allowed to take up water through carelessness in handling they tended to decompose on warming. They had relatively low melting points, and were difficult to present as dry, finely-divided, undecomposed powders. For this reason the oxidation products, the thiuram disulphides, and also the zinc salts of the thiocarbamates were of considerable practical interest. Their behaviour in rubber from the point of view of acceleration, the type of vulcanisate, the need of zinc oxide, etc., was practically the same as that of the parent compounds, the thiocarbamates. But they possessed the additional advantage of a superior physical state, being capable of preparation as dry powders, insoluble in water. An outstanding feature of the super-accelerators was that in the presence of zinc oxide they gave an optimum physical condition, not only in a very short time, and not only with very high tensiles, but also with very low percentages of combined sulphur, *i.e.*, with very low vulcanisation coefficients. This introduced a very interesting line of thought. It was generally assumed that if we took a definite mix and vulcanised, then, as vulcanisation proceeded, the physical state of the rubber ran parallel with, and was even dependent upon, the amount of combined sulphur, until we reached optimum physical state, which was again associated with, and measured by, the

amount of combined sulphur. It was a fact that, by adding accelerator to the mix, the same physical state, or even higher tensiles, could be obtained, not only in a shorter time, but with a much lower percentage of combined sulphur. Judging from the behaviour of other colloidal materials, the increased strength of the rubber might be ascribed to increased linking-up of the groups of rubber molecules, or to some rearrangement in the structure of the rubber colloid. The suggestion arose, therefore, that the accelerator might produce this effect in rubber.

A discussion followed, to which Dr. S. Pickles, Dr. H. P. Stevens, Dr. P. Schidrowitz, Mr. Fordyce Jones, and Mr. H. Rogers contributed.

Society of Glass Technology

Influence of Rapid Chilling on Reversible Expansion

A MEETING of the Society of Glass Technology was held in Leeds on Wednesday, November 21, the President, Professor W. E. S. Turner, D.Sc., being in the chair, when three papers were presented. The first was entitled "Notes on the Influence of Rapid Chilling on the Reversible Expansion of Clay," by Mr. H. S. Houldsworth, in which the author gave some results of measuring the reversible thermal expansion of fireclay test pieces cooled slowly and rapidly. Test pieces were moulded from Farnley fireclay, dried and fired in the surface combustion laboratory furnace to Cone 9 (1280° C.) in three hours and maintained at that temperature for a further two hours. One test piece was removed from the furnace and plunged into a bucket of cold water, and another was placed on a steel plate to cool in the air of the laboratory, while a third was allowed to cool slowly in the furnace for 17 hours. A glass pot mixture of clay and grog obtained from the Stourbridge district in a lathery condition was next examined. There was a considerably greater difference in the temperature—expansion curves of the rapidly-chilled and slowly-cooled specimens after firing at Cone 9 than was found for Farnley fireclay. The expansion of the air-cooled test pieces was intermediate between those of the water-cooled and slowly-cooled samples. At Cone 14, (1410°) the thermal expansion of the air-cooled and water-cooled specimens were nearly the same and considerably less than that of the slowly-cooled test pieces.

The whole of the phenomena were consistent with the explanation that solution of free silica occurred at the higher temperature of heating, that this separated out as cristobalite or tridymite on slow cooling, and exerted its characteristic influence on the expansion curve, but that it did not so separate on rapid cooling. Some imperfect separation was, perhaps, likely, but not in a sufficiently definite form as to be able to exert its proper influence on the expansion phenomena.

A paper by Mr. Percival Marson entitled "Glasshouse Pots: Some Notes on their Manufacture and Use," was read by Professor W. E. S. Turner in the absence of Mr. Marson. This dealt entirely with the details of manufacturing these pots.

The Casting Process in Germany

The third paper dealt with "The Casting Process for Glasshouse Refractories in German Glass Plants" by Professor Kurd Endell, D.Phil., of the Technische Hochschule, Charlottenburg, Berlin. Professor Endell considered that the casting process would give satisfactory results in practice. Success depended upon careful and trained supervision, as well as on the proper selection and preliminary treatment of the clay. When the articles were required for internal use, or when only certain standard sizes of pots or blocks were to be made, manufacture by the casting process was undoubtedly more economical than by hand. All tests hitherto made for comparing the quality of cast goods with that of hand-made goods showed that cast pots were denser than hand-made ones. He was unable to present any precise experimental results on chemical resistance to molten glass, but he believed that cast pots were chemically more resistant than hand-made pots. Tests both with larger cones and under load showed no perceptible difference in heat resistance between cast pots and hand-made pots. He confidently anticipated that the use of the casting process for the shaping of refractory materials would gain an increasing number of adherents.

During the forenoon a party of members had the privilege of visiting the Wortley works of the Leeds Fireclay Co., Ltd.

Society of Chemical Industry

The Preservation of Building Stone

THE preservation of building stone formed the subject of two papers at the meeting of the London Section of the Society of Chemical Industry on Monday. Dr. Bernard Dyer, Chairman of the Section, presided.

The first paper by Mr. J. Allen Howe (Geological Survey of Great Britain) on "The Use and Preservation of Building Stone" was almost entirely of a geological nature, lantern slides being shewn illustrating the micro-structure of various limestones and sandstones. In addition there were slides illustrating the manner in which these building stones are decaying on buildings in and near London.

In the second paper, Dr. J. J. Fox (of the Government Laboratory) and Mr. T. W. Harrison gave an account of work that has been done during recent years in connection with the decaying of building stone, especially in London, and particularly in relation to the question of bacterial action which has been revived recently. It had been found, said Dr. Fox, that the most potent decaying agent is water, apart from mechanical attrition, not because it is water but because of what it carries down from the air on to the stone, viz., the sulphur compounds. Experiments have been carried out to ascertain the amount of sulphur in the London atmosphere and also the amount of SO_2 in rain water, although the figures given were not put forward as absolutely accurate. They did, however, it was stated, represent the conditions, as far as could be ascertained, on the days when the tests were made. From the figures so obtained it was concluded that SO_2 and SO_3 are the principal agents causing damage to building stone in London. Recently, continued Dr. Fox, the argument has been revived that decay of building stone is largely due to nitrifying bacteria, but his view is that that is not the case in London and similar towns, and although this aspect might be important enough to demand investigation he did not think it could be regarded as of first importance. He does not believe that nitrifying organisms can stand against the effect of the sulphur in the air.

No Satisfactory Preservative

Dr. Fox then passed to a consideration of the subject of preservatives for building stone, and suggested that none of those at present available are really effective. There were two schools of preservative advocates. One said that the preservative should be in such a form that it produced an impenetrable skin to the stone, whilst the other alleged that it is wrong to do this because it stopped the natural respiration of the stone. After examining many preservatives he had come to the conclusion that all of them had objections, and it was time that large scale experiments should be carried out with the object of arriving at a suitable preservative. The only thing to do was to start such a series of experiments, not on a laboratory scale, but with a large piece of stone erected under ordinary conditions in the air, in the endeavour to secure a preservative which would be effective. The results might not be available until the next generation but the experiment ought to be made.

Dr. Fox did not agree with using preservatives which alter the surface of the stone, as under these conditions it would be just as well to use an artificial stone which had been proved to last a considerable time if well made. A problem in this connection was the use of organic or inorganic bodies for preservative purposes. Personally, he thought the most likely were inorganic colloids, although there was the possibility of these leaving the pores of the stone as they were originally. Then came the question of whether it is advisable to put a hard layer on the surface of the stone. There were many people who advocated this, but as this layer would be of a different composition to that of the stone itself he did not think it would be a wise course to pursue.

The Evolution of Bleaching

THE pamphlet on "The Evolution of Bleaching," by S. H. Higgins, M.Sc., (reprinted from the *Journal* of the Textile Institute), deals with "Early Developments," "The English Development," and "Materials Used." A review of so large a field in such limited space must necessarily be severely condensed, and the author may be complimented on such an informing and well-proportioned story.

C

Chemical Worker's Death from Cancer

Contracted in Tar Distilling Operations

THE Bradford Coroner (Mr. J. G. Hutchinson) and a jury last week inquired into an unusual case of death resulting from cancer. The inquest was upon William Henry Tate, aged 55, chemical works labourer, of 3, Providence Place, Cleckheaton. The Coroner remarked that he had been holding inquests since 1888, and had never known a similar case.

Peter Jack, foreman tar distiller, employed by Henry Ellison and Co. (Ltd.), tar distillers, Cleckheaton, said that Tate in the course of his work ran off tar, oil, and other by-products into tanks and other receptacles. In his work his clothes would gather a certain amount of substance from the products. The workmen wore hard aprons, supplied by the firm. Tate had been with the firm for 37 years, and had been nine years on his last job. The witness believed that he took reasonable and proper care. He had not complained. There was good washing and bath accommodation at the works, but some of the men would not have baths. There was a notice stating that every employee must wash his hands and face before meals, and take regular baths. The meals were taken in the dining room, and the men always removed their aprons before going into the room.

The Coroner said he was entitled to say from Mr. Taylor that the firm carried out all the regulations and rules incumbent upon them, and had gone further.

Dr. D. L. M. Tod, of the Royal Infirmary, said Tate was admitted on October 22, suffering from a hard ulcer, about the size of a half-a-crown piece. On October 23 an operation was performed, after consultation, and in addition a small wart was removed from inside the skin of the right wrist. Both the ulcer and the wart were cancerous. A second operation was performed for the purpose of removing glands. Tate died on November 7 from tetanus, consequent upon operations for removing a cancerous growth. Witness was aware that investigations had been going on with regard to the risk of skin disease and cancerous growths from contact with tar products and other chemicals.

The Coroner: Having heard the evidence, can you say whether this cancerous growth was, or might probably have been, the result of coming in contact with this tar ?—I should say it might probably have been. Witness added that if he had to give a definite opinion, he would say that it had been caused in Tate's employment.

In reply to Dr. S. A. Henry (Medical Inspector of Factories), Dr. Tod said he had known of only two previous cases of the kind—one an oil works case in Scotland, another the case of a chimney sweeper. Had Tate received treatment for his ulcer at an earlier stage his life would probably have been saved.

The jury returned a verdict in accordance with the medical evidence, the cancer, in their opinion, having been contracted whilst manipulating tar products.

The Coroner said he would like it to be known that there were affections and diseases besides anthrax which were notifiable to the authorities, so that they could be dealt with at once, and possibly life saved. The notifiable diseases were: Lead, phosphorus, arsenical, or mercurial poisoning, anthrax, toxic jaundice, and epitheliomatous or chronic ulceration.

Death of Mr. J. M. Wilkie

WE regret to learn of the death, which occurred on Thursday, November 29, at the age of 47 years, of Mr. J. M. Wilkie, B.Sc., F.I.C., of Nottingham, deputy chief analyst to Boots Pure Drug Co., and chairman of the Nottingham Section of the Society of Chemical Industry. Born at Montrose and educated as a pharmaceutical chemist, Mr. Wilkie held appointments successively in Derby and London, and in 1900 was appointed as an assistant analyst in the laboratory of Boots Pure Drug Company, where he remained till his death.

Perhaps the best known of Mr. Wilkie's researches were the estimation of small quantities of lead, published with Mr. Harvey, the silver methods for the determination of phosphoric acid, and the alkaline iodine oxidation of phenols. He also devised a most ingenious method for the estimation of sulphur and oxidised sulphur compounds, which depended on the formation of acid by the bromide oxidation, but this research has only been published in abstract, as he was never quite satisfied that he had brought it to a satisfactory completion. These sulphur oxidation methods, however, have been in use at Messrs. Boots laboratory for some years with most satisfactory results. The last four years of his life were devoted to research on the determination of minimal quantities of arsenic. Step by step he patiently investigated the points of the method, and at the time of his death his work was concluded, and he was engaged in putting his notes into order for publication. This research was given to the world in abstract at the highly-successful joint meeting of the Society of Public Analysts with the Nottingham section of the Society of Chemical Industry.

As secretary of the Nottingham section from 1914 to the present year Mr. Wilkie was largely responsible for the success of that section and the great increase in the membership. It was always his policy to encourage and bring forward young talent, so much so that at Mrs. Wilkie's special request he was borne to his last resting-place by some of the young men he used to encourage and talk about so often.

In addition to the family mourners at the funeral, there were present Dr. Longstaff (London, representing the Society of Chemical Industry), Dr. Prideaux (representing the University College), Mr. J. C. Boot, Dr. Bowis, and Mr. H. B. Holthouse (Messrs. Boots), the members of the analytical department, and heads of departments of Messrs. Boots, Mr. H. Droop Richmond (representing the Institute of Chemistry), and Mr. S. J. Pentecost and Mr. J. T. Wood (Nottingham Society of Chemical Industry).

Death of Mr. Sydney K. Muspratt

THE death is announced of Mr. Sydney Knowles Muspratt, youngest son of the late Mr. Richard Muspratt, of Trelawny House, Flint, who was senior partner in the firm of Muspratt Brothers and Huntley. For some years Mr. Sydney Knowles Muspratt, who was first cousin of Sir Max Muspratt, had lived in the South of France, and his death took place at St. Jean de Luz on Friday, November 30. He took an active part in municipal and educational matters at Flint, and filled the office of Mayor in 1896 and 1897, and was an alderman of the Council. In 1897, when the Corporation adopted the provisions of the Elementary Education Act, Mr. Sydney Muspratt was appointed the first chairman of the Schools Attendance Committee. He was a Justice of the Peace for both the borough and county of Flint, and filled the office of High Sheriff of Flintshire in 1908. In November, 1885, he married Miss Constance Sackville-Molesworth, and for some years lived at Sefton Park, Liverpool, where his wife took an active part in political and educational matters in the very early days of the University. He leaves a widow and two daughters, one of the latter being the widow of the late Captain Cecil Brunner, who fell in the war in 1917.

The Late Mr. Percy Cryer

THE death of Mr. Percy Cryer, until recently one of the Governing Directors of Millwards Merchandise, Limited, of Manchester, will be deeply regretted by a wide circle of business friends. His genial and generous disposition made him deservedly popular and highly respected. His father was a principal when the title of the firm was Millward and Cryer, and the son proved to be a worthy successor as a principal and subsequently director of this old-established concern, now known all over the world as Millwards Merchandise, Ltd. He bore a very painful illness wth patient fortitude, and leaves a widow and two daughters to mourn his loss.

Atmospheric Corrosion

THE First Experimental Report to the Atmospheric Corrosion Committee of the British Non-Ferrous Metals Research Association will be presented and discussed at a meeting of the Faraday Society to be held on December 17, at 8 p.m., in the rooms of the Chemical Society, Burlington House, W.1. The very comprehensive series of field tests and laboratory experiments described in the report were carried out by Mr. W. H. J. Vernon, on behalf of the Committee. Persons interested in the subject desirous of attending the discussion may obtain a ticket of admission from the Secretary of the Faraday Society, 16, Essex Street, London, W.C.2.

Damages for Breach of a Soap Contract

In the Mayor's and City of London Court, before Judge Shewell Cooper, on Thursday, November 29, a claim was made by the British Commercial Overseas Co., Ltd., importers and exporters, 73, Bishopsgate, against Mr. Hartley Florey, general merchant, 32, Great Tower Street, for £15 10s. damages for breach of contract whereby defendant agreed to purchase 3½ tons yellow bar soap at 14s. 6d. per cwt. on terms cash against delivery order, that the defendant committed a breach by refusing to take up the said goods whereupon the plaintiffs resold the soap against the defendant, claiming the difference in price, £13 10s. The defendant, in his statement of defence, said that under the Sale of Goods Act he demanded and received permission to inspect the consignment of soap in question, that such inspection proved the bulk was not equal to sample submitted and the consignment was thereupon rejected. Defendant's customer, a wholesale grocer, demanded inspection of the bulk and rejected the soap. He said that entitled him to do the same. The Judge said he was afraid the defendant had put himself out of Court because he ought to have inspected the goods, and had had an opportunity of doing so. Although the defendant said he was prepared to stand by his customer's inspection the plaintiffs were not. Upon the evidence he did not see any defence to the case. Judgment was entered for the plaintiffs for £13 10s., the Judge remarking that that case was another example of the extraordinary way some dealers in London did their business.

Technical Chemist's Bankruptcy

An adjourned sitting for the public examination of Mr. Samuel Richard Pearson, of 87, Bishopsgate, London, who has been engaged as a technical chemist, was appointed at the London Bankruptcy Court, on Tuesday, before Mr. Registrar Mellor. His liabilities, according to his statement of affairs, amount to £50,585, of which £991 are expected to rank while he values his assets at £50. The debtor has failed on two previous occasions, and he stated that since his last failure, which occurred in August, 1917, he has acted as a technical chemist reporting on chemical processes, but that the fees which he has earned have been insufficient to meet his personal expenditure, and he has sold the benefits of certain chemical processes to companies in consideration of shares allotted to him. The contingent liability of £49,189 returned in his statement of affairs, and is not expected to rank against his estate is the estimated amount of the liabilities under his first failure when he executed a deed of assignment which he believes did not give him absolute release.

The Official Receiver stated that the debtor, who failed to appear, was an old man, and was unable to attend owing to illness. A medical certificate was lodged in July, when the case was before the Court on a previous occasion. He was undischarged under a previous bankruptcy. The examination was adjourned.

Failure of Pigment Importing Agent

Mr. Sidney George Priest, of 201, Sutherland Avenue, Maida Vale, London, who had been interested in a scheme for the importation of pigments from South Africa, attended before Mr. Registrar Mellor, at the London Bankruptcy Court, on Tuesday, for his public examination on a statement of affairs in which he had returned his liabilities at £4,267, of which £632 was expected to rank. His assets were stated to be nil. Examined by the Official Receiver, the debtor said that in May, 1922, he entered into an agreement with another person by virtue of which in consideration of his investing £700 in the latter's business he was granted the sole selling rights for certain pigments, etc., to be exported from South Africa. He was also to receive a commission of 7½ per cent. on all orders secured. He had actually paid £600 of the £700 promised, while the balance he considered had been satisfied by certain payments that he had made in this country. He secured orders for over £100,000, but they had never been executed. The director attributed his failure and insolvency to the non-delivery of the goods from South Africa with consequent non-payment of commission to himself, to losses by betting and to extravagance in living. He justified the expenditure by the belief that he was then making £400 a month from his contract. The examination was concluded.

Reviews

Industrial Filtration. By Arthur Wright. New York: The Chemical Catalog Company, Inc. Pp. 336. $5.00.

This is a sound book dealing with principles and practice from the American standpoint. Its scope is wisely confined to industrial filtration problems of types familiar to the chemical and allied industries. The first portion handles general principles, a chapter each being devoted to the subdivisions of "Clarification," "Cake Building," "Cake Drying," "Cake Discharging," "Filter Media," etc. No mathematical treatment is given, and the whole subject is treated from a practical standpoint.

In the second portion the construction and mechanics of various filters are dealt with, a chapter being devoted to each type. The order of treatment follows the development of the various types, showing how varying problems and requirements led to the development of the special features of each filter. Bag filters, plate and frame presses, leaf filters, Sweetland and Kelly presses, and the various rotary machines are all excellently described in very complete detail. Dorr apparatus is also discussed. The description follows parallel lines in each case, and the frank summary for each machine of its advantages and disadvantages is a valuable feature. The discussion of frame and chamber presses hardly deals adequately with the great variety of modifications met with in practice, though it is interesting to note the number of applications throughout the book for which these are referred to as still the most suitable plant. One would have liked to have had a fuller treatment of the merits of filter aids, other than "Filtercel"; and practically no figures of operating data are given. It is nevertheless a really useful work, and the style is plain and readable. May the succeeding volumes maintain the standard it has set. E. A. A.

Elementary Physical Chemistry. By W. H. Barrett, M.A. London: Edward Arnold and Co. Pp. 232. 6s.

This book covers the usual subjects of a physical chemistry text book, in a manner suitable for the standard of first or second-year university students, or of final-year school work. A special feature is the endeavour of the author (who is a science master at Harrow School) to provide instructive illustrative experiments throughout the book in connection with the theoretical work, and to present the subject as much as possible as a continuous whole.

Inorganic Complex Compounds. By Dr. Robert Schwarz. Translated by Lawrence W. Bass, Ph.D. New York: John Wiley and Sons, Inc. London: Chapman and Hall, Ltd. Pp. 82. 8s. 6d. net.

A short account is given of the various complex inorganic compounds such as cobaltammines and their analogues, hydrates, polyacids, etc., treated mainly from the theoretical point of view in their bearing on valency and stereo-isomerism. It is a handy little summary of an important branch of theoretical chemistry.

The Spectroscope. By T. Thorne Baker. London: Baillière, Tindall and Cox. Pp. 208. 7s. 6d. net.

The present edition is the second of the above book which was first published in 1907, and deals with the general applications of the spectroscope in analytical chemistry. The main part of the book deals with the theory and use of the various forms of spectroscope, but considerable space is devoted to the data to be obtained from the absorption spectra of coloured solutions, in addition to the more usual problems of analysis from emission spectra.

Alloys Resistant to Corrosion. London: The Faraday Society. Pp. 85. 5s. 6d.

This little book contains a complete reprint of the Transactions of the Faraday Society, dealing with the conference on non-corrodible alloys which was held at Sheffield early in the year. As a collection of records of recent experimental work on such alloys—both ferrous and non-ferrous—it should prove very valuable. Though no definite theory of corrosion was evolved as a result of the conference, a large mass of information was presented concerning the resistance of particular alloys, the whole of which is embodied in the work under review.

From Week to Week

IT IS REPORTED that the American petrol stock decreased 25,832,149 gallons during October, and the total demand is now in excess of the supply.

NOTICES AT 33 out of 78 Welsh tinplate works expired on Saturday, December 1, but there is little likelihood of a stoppage, the men agreeing to the employers' terms.

AT THE INAUGURAL meeting of the Royal College of Science Chemical Association, Dublin, on Wednesday, Professor F. E. Hackett read a paper on "The organisation of applied science for industry and agriculture."

PROFESSOR BRAGG, of Manchester University, has been elected Dean of the Faculty of Science, and Mr. R. Forsyth, demonstrator in Technological Chemistry, has been appointed a member of the Faculty of Technology.

ARSENIC is again the most important feature in the American chemical market, according to *Drug and Chemical Markets*. The price of white arsenic has risen rapidly during the past few months, and a world scarcity is said to exist once again.

A FIRE broke out at the Garston works of Wilson Brothers' Bobbin Co., on Saturday, December 1, in the sawdust storeroom of the chemical department. The fire occurred in the roof of the building, and although it obtained a good hold the brigade soon had it under control.

AN EXPLOSION, resulting in the death of one man and injuries to four others, occurred on Saturday, December 1, at the quarries of the Bradford Corporation at Esholt. It appears that one of the men, carrying gelignite in his pocket, entered a hut to heat some water, and the explosion occurred while he was there. This hut and another were blown to pieces.

AN EXPLOSION took place at the chemical works of G. J. Webb and Co., Middlestone, County Durham, on Wednesday, November 21, as a result of which two men lost their lives. The men were working in a detonator house, and it was part of their work to put fulminite into detonators. It is thought that the men were carrying a container when it burst, killing them instantly.

THE COUNCIL of Leeds University has appointed Mr. Wilfred H. Hoffert, M.A., B.Sc., Oxford, to the post of Research Chemist to the Joint Research Committee of the National Benzole Association and the University, in succession to Professor E. C. Williams, who resigned his appointment on election to the Ramsay Memorial Chair of Chemical Engineering in the University of London.

THE BRITISH SUGAR BEET GROWERS' SOCIETY state that they sent to all the candidates of the three parties a small sample box of the sugar which is now being produced from home-grown beet at the Kelham and the Cantley factories. Both these factories are working night and day in eight-hour shifts, and have absorbed practically all the unemployed labour in the districts in which they are situated.

OWING to the number of deaths caused by the use of hydrocyanic acid in fumigating ships, the United States quarantine officials have been notified to substitute cyanogen chloride, which is a lachrymatory gas and gives ample warning of its presence. The Government chemists have experimented with it in Chemical Warfare Service laboratories, and the regulations of the Public Health Service now authorise its use.

AT A MEETING of the Birmingham Metallurgical Society on Saturday, December 1, Mr. Gilbert Nyle, referred to the contribution of British metallurgists to the industrial progress of the Empire. He said that they saw enormous opportunities for the practice of metallurgy in the proper exploitation of the British Empire, and that we had mineral resources that were unknown and uncharted at the present time.

THE PHYSICAL AND CHEMICAL sections of the University of Durham Philosophical Society met on Monday in the Armstrong College, Newcastle, and listened to two interesting papers. The first of these, by Mr. R. G. Lunnon, dealt with the resistance of air to moving bodies, and he described experiments he had made in many of the pits in the North of England. Mr. J. Taylor contributed a note on the theory of the Neon lamp, and particularly pointed out the application to the measurements of extremely small capacities.

AN EXPLOSION took place at Moorgate Station, London, on November 8, and as a result the City and South London Railway Co. was summoned at the Guildhall on Wednesday, November 28, for having on their premises calcium carbide, which was not hermetically closed in an iron drum. The company repudiated liability, stating that the calcium carbide was supplied under a contract, and that they were not responsible for the actions of their contractors. The court held that there was a lack of supervision and imposed a fine of £10.

THE MAYOR OF BARROW presided at a conference at Barrow on Friday, November 30, held to discuss the proposed reclaiming of the Duddon estuary to secure from the sea vast tracts of land, enabling the known deposits of hæmatite ore to be won, and to provide work for the unemployed. There were representatives present from all the local authorities and industrial companies. The conference discussed the project favourably from the point of view of land and ore reclamation, and passed a resolution requesting the Government to have the site surveyed and the reclamation made in the national interest.

A MEETING of the Bristol and South-Western Counties' Section of the Institute of Chemistry was held at Exeter, when a party of 14 members and friends made the journey from Bristol. After visiting the principal sights in the city, a paper was given by Mr. Arthur Marsden, A.I.C., on "An Interesting Underground Deposit," which related to the formation of an acetate deposit of chemical importance around the outside of a hot gas main, from which there was no trace of leakage. The investigations are unfinished, and much bacteriological and analytical work remained to be carried out in order to elucidate the problem.

AT AN ADJOURNED INQUEST, held at Walsall on Thursday, November 22, on a painter, formerly in the employ of the L. M. & S. Railway Co., it was stated that the man had been ill since March last, and that lead poisoning was suspected. The doctor stated that a post-mortem examination showed the presence of a malignant growth which affected every organ of the body, and she expressed the opinion that there had been no connection with lead poisoning. A report from the Public Health Department of the Birmingham University confirmed the evidence she had previously given. The Coroner returned a verdict in accordance with the medical evidence, but said this would not prevent proceedings being taken in another Court, in which event it was possible that some connection between lead poisoning and the cause of the man's death might be shown.

A GENERAL MEETING of the members of the Royal Institution was held on Monday, Sir James Crichton-Browne, Treasurer and Vice-President, in the chair. It was announced that the managers had elected Mr. Joseph Barcroft, F.R.S., Fullerian Professor of Physiology in succession to Sir Arthur Keith. The special thanks of the members were returned to Dr. Rushton Parker for his donation of £100 towards the improvement of the library. M. le Duc de Broglie, Dr. C. L. Guillaume, and Professors Debye, Einstein, Groth and Von Laue were elected honorary members of the institution. Miss Day, Mrs. Grimsdale, Mrs. King, Miss Moller, Mrs. Tippinge, Sir George Beilby, Colonel Hippisley, Sir Alfred Hopkinson, Sir Richard Paget, Dr. J. H. Jeans, F.R.S., Professor Arthur Smithells, F.R.S., and Messrs. A. S. C. Ackermann, F. H. Hargrove, H. M. Hubbard, F. L. Lawson-Johnston, M. Mannaberg, E. B. Michell, A. Muller, B. J. Orsman and G. Shearer, were elected members.

DR. S. JUDD LEWIS has been awarded the gold research medal of the Worshipful Company of Dyers, on the recommendation of the Society of Dyers and Colourists, for his work on the quantitative determination of the fluorescent power of various forms of cellulose and its derivatives, published in the Journal of the Society. It has been shown that the form and dimensions of the fluorescence curve, having as its co-ordinates the wave-length and fluorescent power per cent. relative to a standard paper, are related to the chemical constitution of the substance. The curves for pure cellulose, hydrocellulose, oxycellulose, cellulose acetate, etc., as well as those for various sugars, are all characteristic, with peculiarities in common for those substances of similar structure. The physical condition of the material has very little effect on the results. It is anticipated that this new method, which is conducted photographically, will prove useful in throwing light on the constitution of opaque solid substances in much the same way as absorption spectroscopy is applied to the investigation of transparent fluids.

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CARBON MONOXIDE.—The decomposition of carbon monoxide. G. Fester and G. Brude. *Ber.*, November 7, 1923, pp. 2245–2249.

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Derivatives of dithio-ethylene and dithio-acetylene. E. Fromm and H. Landmann. *Ber.*, November 7, 1923, pp. 2290–2294.

OXIDES.—Ruthenium tetroxide. Part II. F. Krauss. *Z. anorg. u. allg. Chem.*, November, 1923, pp. 348–360.

ATOMIC WEIGHTS.—Revision of the atomic weight of bromine by the synthesis of silver bromide. O. Hönigschmid and E. Zintl. *Annalen*, September 29, 1923, pp. 201–230.

Miscellaneous

SULPHURYL CHLORIDE.—The preparation of sulphuryl chloride. W. J. Pope. *Rec. Trav. Chim. des Pays-Bas*, September 15, 1923, pp. 939–941.

SYSTEMS.—Heterogeneous equilibria in the ternary system sodium sulphite—sodium sulphate—water. A. C. D. Rivett and N. B. Lewis. *Rec. Trav. Chim. des Pays-Bas*, September 15, 1923, pp. 954–963.

HALOGEN COMPOUNDS.—New methods for the estimation of chlorine, bromine and iodine in organic compounds. Part I. Hydrogenation method. H. ter Meulen and J. Heslinga. *Rec. Trav. Chim. des Pays-Bas*, November 15, 1923, pp. 1093–1096.

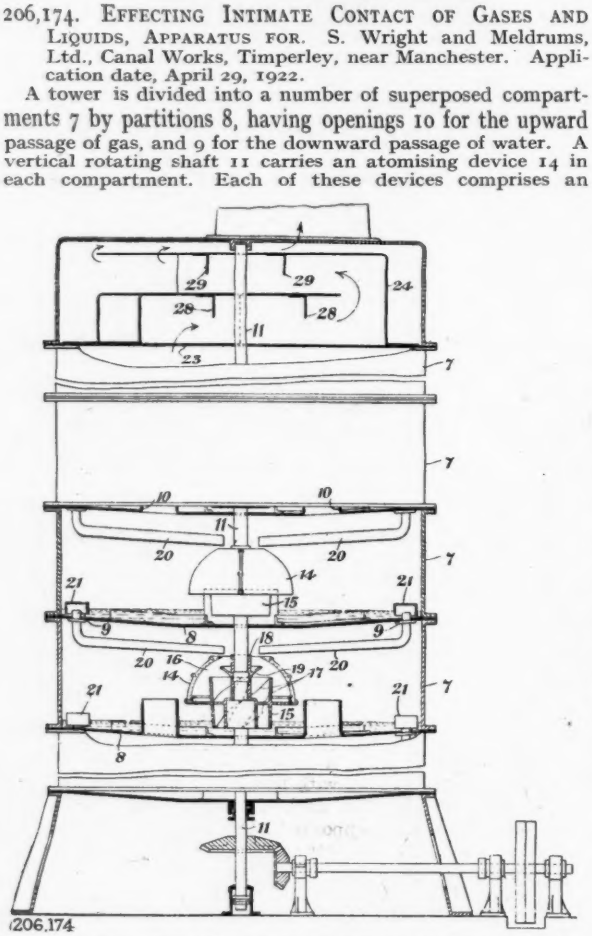
The action of bromine on *a*-aminopyridine. J. P. Wibaut and G. M. Kraay. *Rec. Trav. Chim. des Pays-Bas*, November 15, 1923, pp. 1084–1091.

Patent Literature

Abstracts of Complete Specifications

206,174. EFFECTING INTIMATE CONTACT OF GASES AND LIQUIDS, APPARATUS FOR. S. Wright and Meldrums, Ltd., Canal Works, Timperley, near Manchester. Application date, April 29, 1922.

A tower is divided into a number of superposed compartments 7 by partitions 8, having openings 10 for the upward passage of gas, and 9 for the downward passage of water. A vertical rotating shaft 11 carries an atomising device 14 in each compartment. Each of these devices comprises an



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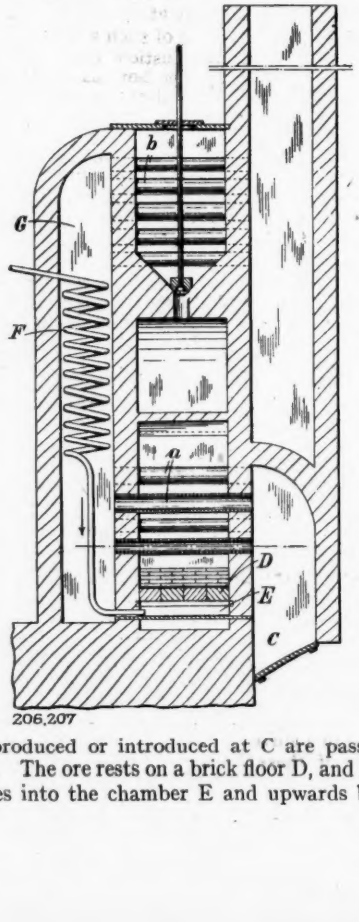
inverted truncated hollow cone 15 surrounded by a spherical screen 16 of gauze or other perforated material. The cone is provided with curved vanes 17, which connect it with a sleeve 18 mounted on a shaft 11 and carrying a deflector 19 at its upper end. The openings 10 for the passage of gas are provided at the centre of the partition 8 and around the atomising devices 14. The water discharge pipes 20 project upwards into each compartment to maintain the level of the liquid above the bottom of the cones 15. Gas is prevented from passing through the pipes 20 by sealing caps 21. Water is delivered by the pipes 20 into the atomisers 14, which project it outwards in the form of a fine spray, and the vanes 17 raise water from the bottom of the compartments and also project it in the form of spray. The washed gas passes through an opening 23 into a chamber 24, where suspended water is deposited on a series of baffles 28, 29. These baffles are arranged so that the gas passes through in a sinuous course. The apparatus is suitable for washing water, coal, coke oven, and like gases.

206,178. DESTRUCTIVE DISTILLATION OF COAL AND SIMILAR CARBONACEOUS SUBSTANCES. T. M. Davidson, Park Cottage, Sharps Lane, Middlesex. Application dates, May 1, 1922, and March 1, 1923.

A vertical retort for distilling coal is provided internally with a secondary wall divided longitudinally into a number of sections to which a reciprocating longitudinal movement is imparted to maintain the mass of coal free for its passage through the retort, and to ensure its compact settling. The sections of the secondary wall may be tapered in thickness, or reduced in a series of steps towards the lower end, and may be formed of metal. The distilled vapour is drawn off through a central outlet tube which may extend the whole length of the retort. This tube may also be divided into sections which may be reciprocated with the sections of the internal wall. The tube may alternatively be in one piece and may be reciprocated or rotated as a whole to prevent sticking of the coal. The retort is heated in zones of increasing temperature from the top towards the bottom, and the diameter may increase towards the bottom, while the lower part is constructed of firebrick and the upper part of metal. The gas is drawn off in the direction of movement of the coal, so as to pass through the zone of highest temperature. The temperature in the retort varies between 300° C. and 700° C.

206,207. SULPHIDE ORES AND MINERALS, TREATMENT OF. E. F. Petersson, 28, Victoria Street, London, S.W.1, and S. Field, Northampton Polytechnic Institute, St. John's Street, London, E.C.1. Application date, July 27, 1922.

The object is to treat sulphide ores with zinc to obtain the sulphur as sulphuretted hydrogen or elemental sulphur, and to leave the ore in a form suitable for the extraction of the metal by the usual methods. This result is obtained by passing dry superheated steam over the heated sulphide ore. This reaction is endothermic, and heat must be supplied, but the quantity of steam used may be just sufficient for the reaction, while with the usual air-roasting, a large volume of inert nitrogen has to be passed over the ore. The sulphuretted hydrogen obtained may be mixed with a limited amount of air and passed over heated iron oxide to obtain sulphur. Alternatively, the steam used for the calcination may be mixed with a limited amount of air, so that the sulphuretted hydrogen is burned to obtain sulphur. In this case some sulphur dioxide may be produced, but this reacts with the sulphuretted hydrogen to produce sulphur. The temperature of calcination necessary is about 650° C. in the case of zinc blende. The illustration shows a suitable form of furnace. The body is square, and fireclay tubes *a* are built into it, and



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hot gases produced or introduced at C are passed through these tubes. The ore rests on a brick floor D, and superheated steam passes into the chamber E and upwards between the

bricks, which are not cemented, into the ore. The ore containing the minimum of sulphur thus comes into contact with the fresh steam. The hot gases after heating the ore pass into a chamber G to superheat the steam in a coil F, and then pass through tubes *b* to preheat the fresh charge of ore. The sulphuretted hydrogen and steam are drawn off through a conduit at the top of the calcining chamber. It is necessary that no heated iron parts should come into contact with the sulphuretted hydrogen. It is found that the use of steam prevents the formation of silicates and ferrites, which would interfere with the subsequent hydrometallurgical process for the recovery of zinc. Some zinc sulphate is produced by this process, but it is desirable that 10–20 per cent. of zinc sulphate should be present in the treated ore to make up for the loss of sulphuric acid in subsequent operations in which the zinc is recovered from its sulphate solution. The proportion of zinc sulphate may be regulated to any desired amount by introducing a limited quantity of air towards the end of the operation.

206,229. CONDENSING THE ACID FUMES EVOLVED DURING THE CONCENTRATION OF SULPHURIC ACID, PROCESS FOR. Chance and Hunt, Ltd., Oldbury, W.A.S. Calder, Ravensthorpe, Harbourne, Birmingham, and W. H. Palmer, 208, Londonderry Lane, Smethwick, Birmingham. Application date, August 1, 1922.

The condensation of the acid fumes evolved in the concentration of sulphuric acid is facilitated by adding 20–35 per cent of water in the form of steam or fine spray to the gases carrying the sulphuric acid. Alternatively, the gases may pass through water or through a tower through which water flows over packing material.

206,245. CHARCOAL, PROCESS AND APPARATUS FOR THE PRODUCTION OF. S. Hiller, P.O. Box 248, San Jose, Santa Clara Co., Cal., U.S.A. Application date, August 3, 1922.

The object is to produce charcoal from waste material such as nutshells by an apparatus in which large quantities of the raw material may be treated continuously in a comparatively short time. An open-ended retort is used, slightly inclined to the horizontal, and mounted on rollers so that it may be rotated. The retort is lined with fireclay, and the raw material is introduced continuously at the upper end. The material is ignited, but the retort is of such a length that the flame is extinguished by the combustion gases before the material reaches the other end. The hot material is cooled by a spray of water just before the discharge from the lower end.

206,267. BASE EXCHANGING COMPOUNDS, MANUFACTURE AND PRODUCTION OF. T. P. Hilditch, Birchdene, Cross Lane, Grappenhall, Cheshire; H. J. Wheaton, 5, Walton New Road, Lower Walton, near Warrington, and Joseph Crosfield and Sons, Ltd., Warrington. Application date, August 14, 1922.

Specification No. 177,746 (See THE CHEMICAL AGE, Vol. VI., p. 602) describes the manufacture of base-exchanging compounds or gels, particularly suitable for the purification and softening of water, by treating a solution of sodium silicate with sodium aluminate. It is now found that the sodium aluminate may be replaced with certain acidic salts, or salts of complex acids such as sodium pyroborate or borax, sodium dichromate, sodium bicarbonate, sodium metaphosphate, sodium dihydrogen phosphate, sodium pyrosulphate, sodium bisulphate, and sodium bisulphite. Alternatively, mixtures of more than one of these salts may be used, or mixtures of these with sodium aluminate. The proportions may be one molecular proportion of the acidic oxide of such compound to one to five molecular proportions of silica. The concentration of the silicate solution may be up to 40° Tw., and of the added solution about 15°—29° Tw. If the compound is of low solubility, a saturated solution may be used. In an example, 2,730 parts of a solution of sodium silicate containing 333 parts of silica and 111 parts of sodium oxide are mixed with a saturated solution of 456 parts of crystallised borax. The mixture contains about 6 grams of solids per 100 cubic centimetres and sets to a homogenous gel, which is then dried in a current of air. Several other examples of the production of these base exchanging compounds or gels are given.

206,268. POROUS OR ABSORBENT MATERIAL, MANUFACTURE AND PRODUCTION OF. T. P. Hilditch, Birchdene, Cross Lane, Grappenhall, Cheshire, H. J. Wheaton, 5, Walton New Road, Lower Walton, near Warrington, and Joseph Crosfield and Sons, Ltd., Warrington. Application date, August 14, 1922.

The starting material is the gel produced as described in Specification No. 206,267 above. The dried gel is powdered and boiled in dilute sulphuric acid until all soluble matter is eliminated. The material is then washed and dried to any desired degree. This product is not attacked by acids, and is highly porous, so that it is capable of absorbing a large volume of liquid. The process of preparation is described in detail.

206,284. TITANIUM COMPLEXES AND METHOD FOR PRODUCING SAME. W. P. Carpmael, London. From H. H. Buckman, 130, Copeland Street, Jacksonville, Duval Co., Fla., U.S.A. Application date, August 29, 1922.

The object is to produce titanium complexes from substances containing titanium, especially ilmenite and rutile. In the known process for extracting titanium from ilmenite, the ore is heated with sulphuric acid at atmospheric pressure, yielding a solution of titanium sulphate with some iron sulphate, and a complex residue containing titanium and iron, which is a waste product. The titanium is recovered by hydrolysis of the sulphate solution. In the present invention, the ilmenite is heated with sulphuric acid under pressure, and most of the titanium remains in the residue, practically all the iron being in solution. The ilmenite is finely ground and then water-floated or air-floated, the very fine sub-division thus obtained producing better results than can be obtained with ordinary fine grinding. Sulphuric acid slightly in excess of the calculated amount is then added, and the mixture placed in an acid-proof container and heated until the pressure reaches about 200 lb. per square inch. The acid is then diluted with four times its volume of water, and the pressure restored to 200 lb. and the mixture allowed to cool. The solution contains iron and sulphuric acid and a small amount of titanium sulphate, while the solid precipitate consists essentially of titanium complexes. This product, when washed and dried, is a very fine, dense, white powder of great pigmenting power. If a pure white product is required, the ilmenite is mixed with finely ground phosphate rock before heating with acid, or the latter may be added with the water after heating. Composite products of a titanium complex and barium sulphate, lime, etc., may be obtained by adding these substances to the ilmenite before heating with the acid. The calcium-titanium product is preferably obtained by adding gypsum to the mixture of sulphuric acid and ilmenite, or by adding calcium carbonate or hydrate at the same time as the water is added. These products are particularly suitable as pigments for the manufacture of paints, inks, enamels, etc., and also when mixed with white lead, zinc white, lithopone, barytes, zirconium oxide, etc. They are also suitable as fillers for rubber, etc.

206,372. SODIUM COMPOUND, PROCESS FOR THE PRODUCTION OF. H. E. Cocksedge, Milford, Hartford, Cheshire. Application date, November 15, 1922.

Specification 202,678 (*see* THE CHEMICAL AGE, Vol. IX, p. 348) describes the production of a compound having the formula $Na_2CO_3.3NaHCO_3$. It is now found that this compound may be prepared by passing carbon dioxide saturated with moisture at 82° C. over dry sodium carbonate at 95° C. with agitation until the weight of the carbonate increases 35 per cent.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 186,589 (Farbenfabriken vorm F. Bayer and Co.) relating to a process and apparatus for the extraction of zinc from zinciferous materials, see Vol. VII, p. 798.

International Specifications not yet Accepted

204,721. SYNTHETIC DRUGS. Farhwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date, September 29, 1922. Addition to 155,577.

A mono- or di-formaldehyde bisulphite compound of an arsenobenzene is combined with an arsenobenzene, either dry or in solution or suspension. In an example, the two

compounds used are the monoformaldehyde bisulphite compound of, and the silver compound of the sodium salt of 3 : 3′-diamino-4 : 4′-dioxyarsenobenzene. The products are stable.

204,722. AROMATIC AMINES. Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date, September 29, 1922.

Aniline or a homologue, having an unoccupied para-position, in the form of a salt in aqueous solution, is heated with an aliphatic ketone, yielding diamino-diaryl-dialkyl-methanes, which form starting materials for dye preparation. Diamino-diphenyl-dimethyl-methane is obtained by heating a solution of aniline hydrochloride with acetone in an autoclave. The product is isolated by making the solution alkaline, distilling off excess of aniline, and crystallising from boiling water. Corresponding products are obtained from *o*-toluidine and acetone, and from aniline and methylethylketone.

205,078. MAGNESIA. R. Monterumici, 10, Via Meravigli, Milan, Italy. International Convention date, October 3, 1922.

Calcined magnesite, brucite or dolomite, or hydrated magnesia, or magnesium sulphate or a mineral containing it, is treated with water and ammonium sulphate or chloride. Some of the magnesia is precipitated by adding ammonia, and then separated, and the liquor is used to treat more raw material.

205,081. SILICA GEL. Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. International Convention date, October 4, 1922.

Water glass solution is treated with dilute hydrochloric acid, and the gelation of the resulting hydrosol is assisted by heat. A large proportion of the water is removed by compressing the gel under 350 atmospheres pressure for one hour, and the product is washed, and dried in vacuo. The product is granular or pulverulent, and its absorptive properties are not diminished.

205,103. COMMON SALT AND CAUSTIC SODA. E. G. R. Angel, Hudiksvall, Sweden. International Convention date, October 6, 1922.

Brine is electrolysed and the resulting solution evaporated until the specific gravity reaches 1·25–1·3. Sodium chloride is separated in the form of coarse crystals, which are washed. The remaining solution is again evaporated, and the remainder of the sodium chloride separates in the form of fine crystals which cannot be washed. The alkali contained in these crystals is recovered by re-dissolving them in fresh liquor which is then evaporated as above to separate the sodium chloride as coarse crystals. The evaporation may alternatively be effected in one stage, which separates fine crystals, and these may be added to a saturated solution of pure sodium chloride and allowed to grow by slow evaporation of the solution. Pure brine is used for the electrolysis and is obtained by adding sodium carbonate and then trisodium phosphate to the crude brine solution.

LATEST NOTIFICATIONS.

207,489. Processes for obtaining oxalic acid or its salts. Bhopal Produce Trust, Ltd. November 25, 1922.

207,499. Manufacture of formaldehyde condensation products of aliphatic amines, and products obtained thereby. Naugatuck Chemical Co. November 27, 1922.

207,542. Process for the treatment of oleaginous grains and other oily bodies. Soc. Anon. Acetoleum. November 24, 1922.

207,545. Method for producing edible products rich in vitamines. P. M. Heyerdahl. November 23, 1922.

207,546. Manufacture of yeast. C. Langemeyer. November 23, 1922.

207,551. Process for treating fats or oils. P. M. Heyerdahl. November 25, 1922.

207,553. Production of vat colouring-matters. Kalle and Co. Akt.-Ges. November 25, 1922.

207,555. Manufacture of titanic and zinc compounds. P. Pipereaut and A. Helbronner. November 25, 1922.

Specifications Accepted, with Date of Application

197,632. Rubber, Processes for vulcanizing—with condensation products of ammonia and aldehydes as accelerators. Naugatuck Chemical Co. May 15, 1922.

198,379. Barbituric acid compounds, Manufacture of. Chemische Fabrik Auf Actien vorm. E. Schering. May 29, 1922. Addition to 158,558.

201,925. Gases discharged from, and air fed to producer plants Apparatus for treating. R. A. A. G. Mahieu. August 2, 1922.

203,683. Manures containing soluble organic nitrogen, Process for manufacturing from cyanamide. Soc. d'Etudes Chimiques pour l'Industrie. September 8, 1922. Addition to 197,690.

206,475. Purifying or separating apparatus for liquids. K. J. Svensson and K. A. P. Norling. November 3, 1922.

206,982. Scrubbers for use in gas-producer plants. Ruston and Hornsby, Ltd., F. H. Livens, and F. J. Grieve. October 4, 1922.

207,000. Dyestuffs. J. Thomas and Scottish Dyes, Ltd. October 20, 1922.

207,041. Distilling oil, Apparatus for. T. E. Robertson. (*Power Specialty Co.*) November 23, 1922.

207,073. Oils from shales and non-caking coals, Process for obtaining. H. Edwards and G. Young. January 9, 1923.

207,094. Separation of dry materials, Process and apparatus for. H. M. Sutton, W. L. Steele, and E. G. Steele. February 20, 1923.

Applications for Patents

Auld, S. J. M., Dunston, A. E., and Herring, P. H. Treatment of liquid hydrocarbons. 30,128. November 29.

Auld, S. J. M., Dunston, A. E., and Herring, P. H. Apparatus for treatment of liquid hydrocarbons. 30,129. November 29.

Badische Anilin- and Soda-Fabrik, and Johnson, J. Y. Production of hydrogen or gases containing hydrogen. 29,748. November 26.

Braund, E. T., and Peachey Process Co., Ltd. Production of adhesive paste from rubber latex, etc. 29,925. November 28.

Bredig, G., and Elod, E. Production of cyanide compounds. 30305. December 1.

British Dyestuffs Corporation, Ltd., and Frank, G. H. Dyeing cellulose acetate. 30186. November 30.

Candy, F. P. Apparatus for filtration of water. 30237. December 1.

Coke, B. E., and Maxted, E. B. Oxidation of naphthalene, etc. 29800. November 27.

Coke, B. E., and Maxted, E. B. Oxidation of aromatic hydrocarbons. 29801. November 27.

Fryer, P. J., and McDougall and Yalding, Ltd. Insecticides, etc. 30304. December 1.

Haco Ges. Akt.-Ges. Bern. Production of albumen products or compounds. 30193. November 30. (Switzerland, December 9, 1922.)

Haco Ges. Akt.-Ges. Bern. Production of albumen dyestuff compounds. 30202. November 30. (Switzerland, December 20, 1922.)

Helbronner, A., and Pipereaut, P. Manufacture of titanic and zinc compounds. 29774. November 26. (France, November 25, 1922.)

Imray, O. Y., and Soc. of Chemical Industry in Basle. Vat dyestuff. 30102. November 29.

Kalle and Co. Akt.-Ges. Production of vat colouring-matters. 29730. November 26. (Germany, November 25, 1922.)

Mathieson Alkali Works, Inc. Manufacture of hypochlorites. 29972. November 28. (United States, June 27.)

Merck, E. [Firm of]. Preparation of synthetic *d*-ψ and *l*-ψ-cocaine. 30087. November 29. (Germany, January 17.)

Sharp and Dohme, Inc. Manufacture of alkyl resorcinols. 29970. November 28. (United States, July 31.)

Sharp and Dohme, Inc. Manufacture of aralkyl resorcinols. 29975. November 28. (United States, October 9.)

Silver Springs Bleaching and Dyeing Co., Ltd., and Hall, A. J. Preparation of dyes for dyeing cellulose-acetate products. 29797. November 27.

Stevenson, W. J. Manufacture of acetyl cellulose. 29737. November 26.

Sir Ernest Benn and the Capital Levy

ARISING out of the contribution to *The Times* by Sir Ernest Benn on "The Capital Levy," which was reprinted in THE CHEMICAL AGE of November 24, an article appeared shortly afterwards in *The Daily Herald* by Mr. Pethick Lawrence. Replying in a letter to *The Daily Herald*, which was not published, Sir Ernest Benn states: "He (Mr. Lawrence) refers to an Inland Revenue Return which shows that 60 per cent. of traders have no overdraft at their bankers, and cheerfully declares that 'all such men could meet the Levy by securing a temporary overdraft.' If Mr. Lawrence will pause to consider where overdrafts come from he will regret this amazing exposure of the simplicity of his mind. A bank can only grant an overdraft to a customer if some other customer makes a deposit, and the horrible position in which 40 per cent. of our traders are in debt to the bank, instead of being a point in favour of the Levy, is a very big danger signal showing its impossibility."

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

London, December 6, 1923.

A FAIR amount of business has passed during the past week, and there is a moderate activity, greater interest in chemicals generally being shown in the textile districts.

There is more export inquiry, and a fair volume of business has been transacted.

General Chemicals

ACETONE is much firmer in price, and stocks are small.

ACID ACETIC has been in active demand; the price is advancing.

ACID CARBOLIC is in very slow demand, and exhibits a drooping tendency.

ACID CITRIC is rather firmer, and any increase in the demand would be quickly reflected in the price.

ACID LACTIC is in good inquiry, and the price is very firm.

ACID TARTARIC is firmer in price, and a further advance is expected.

FORMALDEHYDE is in fair demand at recent figures.

LEAD ACETATE is unchanged.

LIME ACETATE is firm and scarce.

LITHOPONE is a fair market, and the price is firmly held.

METHYL ALCOHOL is firm, with little available in early positions.

POTASSIUM PERMANGANATE is a firm market.

POTASSIUM PRUSSIATE is in better demand; the price seems likely to improve.

SODA ACETATE is very firm in price, and makers are well sold ahead.

SODA BICHROMATE is in good request at recent values.

SODA NITRITE is very scarce and much dearer.

SODA PRUSSIATE is a firm market, although the demand is slow.

SODA SULPHIDE is unchanged.

Pharmaceutical Chemicals

ACETYL SALICYLIC ACID has been readily sold at last prices, the tendency being firm.

AMIDOPYRIN has been in better demand and is expected to advance when stocks are liquidated, as they cannot be replaced at present prices.

BETANAPHTHOL RESUBLIMED is firmer.

BROMIDES are rapidly moving upwards in sympathy with the prices ruling on the Continent.

CAFFEINE PURE is advancing.

CHLORAL HYDRATE is firmer.

GUAIACOL LIQUID AND PURE CRYSTALS have moved upwards; supplies on the spot are none too plentiful.

METHYL SALICYLATE has been in good demand, and the price is unchanged.

SODA SALICYLATE is unchanged. The seasonable demand continues, arrivals finding a ready sale.

THEOBROMINE, PURE, is firm; higher prices are being asked.

VANILLIN has been in better request; the price tends to move slightly upwards.

Coal Tar Intermediates

THIS market does not show any particular change from last week, but some fair inquiries have been received and orders booked both on home and export account.

ALPHA NAPHTHOL continues firm and in good demand.

ALPHA NAPHTHYLAMINE is without special feature.

ANILINE OIL.—Some fair contracts have been placed.

ANILINE SALT is steady, with foreign buyers in the market.

BENZIDINE BASE.—Some inquiries have been received.

BETA NAPHTHOL has been of special interest on foreign account.

BETA NAPHTHYLAMINE has been inquired for, and there does not seem to be much available in re-sale hands.

DIMETHYLANILINE is unchanged, with a fair business passing.

DIPHENYLAMINE is in demand and the price is firm.

"H" ACID is featureless.

NITROSOPHENOL has been the object of some interest.

PARANITRANILINE has been a fair home trade at recent values.

RESORCIN.—Spot stocks continue short.

Coal Tar Products

There is little material change in the price of coal tar products from last week.

90% BENZOL is plentiful, and can be bought at 1s. 2d. per gallon on rails in tank-wagons.

PURE BENZOL is also plentiful, and is worth 1s. 6d. to 1s. 7d. per gallon on rails.

CRESOTE OIL is firm, at 8¾d. to 9d. per gallon in the North, while the price in the South is from 9¾d. to 10d. per gallon.

CRESYLIC ACID is fairly plentiful, with no great inquiry, and is quoted at 1s. 10d. to 2s. per gallon for the Pale quality 97/99%, while the Dark quality 95/97% is worth 1s. 6d. to 1s. 8d. per gallon.

SOLVENT NAPHTHA is also plentiful at 11d. to 1s. per gallon on rails.

HEAVY NAPHTHA is worth about 1s. per gallon on rails.

NAPHTHALENES are steady at £7 to £7 10s. per ton for the low grade, £8 to £8 10s. for 74/76 quality, while 76/78 is quoted at £8 15s. to £9 5s. per ton.

PITCH is weak and prices continue to drop. To-day's values are 115s. to 120s. f.o.b. London, 110s. f.o.b. East Coast, 105s.–110s., f.o.b. West Coast.

Sulphate of Ammonia

This is in somewhat better demand and prices are well maintained.

[Current Market Prices on following pages.]

U.S.A. Synthetic Organic Chemical Industry

MR. AUGUST MERZ has been elected chairman of the Dyestuffs Division of the U.S.A. Synthetic Organic Chemical Manufacturers' Association. At the annual meeting satisfaction was expressed with the operation of the Tariff law. Dr. Hertz, the president of the Association, who is on a visit to Europe, has issued a statement in reference to the financial mission to America of Professor Karl Bosch, a director of the Badische concern, in which he says:—"American bankers are always looking for business, but I cannot conceive of any being willing to take such a risk as lending money to a German dye corporation, in view of all that these plants mean to the French and Belgians in making war and in view of the uncertainty, pending conferences with the Reparation Commission concerning the renewal of reparation dyes. I find from conferences here that the French have their eyes wide open to the threat inherent in these plants against their future security. The French and Belgians have the whole situation thoroughly in hand and, judging from Poincaré's past record and statement to the German Emissary, they don't propose to let the situation ever again get out of their hands. If Germany should begin a ruthless commercial warfare to recover the American markets, she would have to make financial sacrifices. On the surface she appears not to have the necessary funds. Therefore there would be no commercial war unless outsiders help the Germans."

Arsenic Production in Canada

ACCORDING to the Dominion Bureau of Statistics, with the exception of arsenic there were no outstanding differences between the Canadian production in 1922 and the previous year of non-metallic minerals. The production of arsenic in 1922 was 2,576 tons, an increase of 1,085 tons or 42 per cent. when compared with 1921. Large quantities of this commodity are being used in the United States for insecticides which are found to be particularly effective in combating the boll-weevil, the insect which has caused great damage in the cotton districts during recent years.

Current Market Prices

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride, 90–95%	lb.	0	1	4	to	0	1	5
Acetone oil	ton	80	0	0	to	85	0	0
Acetone, pure	ton	125	0	0	to	126	0	0
Acid, Acetic, glacial, 99–100%	ton	73	0	0	to	74	0	0
Acetic, 80% pure	ton	49	0	0	to	50	0	0
Acetic, 40% pure	ton	24	0	0	to	25	0	0
Arsenic, liquid, 2000 s.g.	ton	85	0	0	to	88	0	0
Boric, commercial	ton	48	0	0	to	52	0	0
Carbolic, cryst. 39–40%	lb.	0	1	0½	to	0	1	1
Citric	lb.	0	1	5	to	0	1	5½
Formic, 80%	ton	52	0	0	to	54	0	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	39	0	0	to	40	0	0
Lactic, 60 vol.	ton	45	0	0	to	47	0	0
Nitric, 80 Tw.	ton	24	0	0	to	25	0	0
Oxalic	lb.	0	0	5½	to	0	0	6
Phosphoric, 1.5	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, technical	lb.	0	1	9½	to	0	2	0
Sulphuric, 92–93%	ton	6	0	0	to	7	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	0½	to	0	1	1
Alum, lump	ton	12	10	0	to	13	0	0
Chrome	ton	23	0	0	to	24	0	0
Alumino ferric	ton	7	0	0	to	7	5	0
Aluminium, sulphate, 14–15%	ton	8	10	0	to	9	0	0
Sulphate, 17–18%	ton	10	10	0	to	11	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
.880	ton	32	0	0	to	34	0	0
.920	ton	22	0	0	to	24	0	0
Carbonate	ton	30	0	0	to	32	0	0
Chloride	ton	50	0	0	to	55	0	0
Muriate (galvanisers)	ton	32	0	0	to	33	0	0
Nitrate (pure)	ton	40	0	0	to	45	0	0
Phosphate	ton	63	0	0	to	65	0	0
Sulphocyanide, commercial 90%	lb.	0	1	1	to	0	1	3
Amyl acetate, technical	ton	280	0	0	to	300	0	0
Arsenic, white powdered	ton	65	0	0	to	68	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Carbonate, Precip.	ton	15	0	0	to	16	0	0
Chlorate	ton	65	0	0	to	70	0	0
Chloride	ton	15	0	0	to	15	10	0
Nitrate	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	0	11	to	0	1	0
Bleaching powder, 35–37%	ton	10	7	6	to	10	17	6
Borax crystals, commercial	ton	25	0	0	to	—		
Calcium acetate, Brown	ton	13	0	0	to	14	0	0
Grey	ton	22	0	0	to	23	0	0
Carbide	ton	13	0	0	to	13	10	0
Chloride	ton	5	15	0	to	6	0	0
Carbon bisulphide	ton	35	0	0	to	40	0	0
Casein technical	ton	80	0	0	to	90	0	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	1	to	0	1	2
Sulphate	ton	25	0	0	to	25	10	0
Cream Tartar, 98–100%	ton	86	0	0	to	88	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	66	0	0	to	67	0	0
Formusol (Rongalite)	lb.	0	1	11	to	0	2	0
Glauber salts, commercial	ton	4	0	0	to	4	10	0
Glycerin crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal	0	2	0	to	0	2	1
Iron perchloride	ton	18	0	0	to	20	0	0
Sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	44	0	0	to	46	0	0
Carbonate (White Lead)	ton	50	0	0	to	52	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	37	0	0	to	39	0	0
Lithophone, 30%	ton	22	10	0	to	23	0	0
Magnesium chloride	ton	3	10	0	to	3	15	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	5	15	0	to	6	0	0
Sulphate (Druggists')	ton	8	0	0	to	9	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	45	0	0	to	50	0	0
Methyl acetone	ton	82	0	0	to	85	0	0
Alcohol, 1% acetone	ton	80	0	0	to	85	0	0
Nickel sulphate, single salt	ton	37	0	0	to	38	0	0
Ammonium sulphate, double salt	ton	37	0	0	to	38	0	0
Potash, Caustic	ton	30	0	0	to	32	0	0
Potassium bichromate	lb.	0	0	5½	to	0	0	6
Carbonate, 90%	ton	30	0	0	to	31	0	0
Chloride, 80%	ton	9	0	0	to	10	0	0
Chlorate	lb.	0	0	3½	to	—		
Metabisulphite, 50–52%	ton	65	0	0	to	70	0	0
Nitrate, refined	ton	38	0	0	to	40	0	0
Permanganate	lb.	0	0	10½	to	0	0	10¾
Prussiate, red	lb.	0	2	10	to	0	3	0
Prussiate, yellow	lb.	0	0	10½	to	0	0	11
Sulphate, 90%	ton	10	0	0	to	10	10	0
Salammoniac, firsts	cwt.	2	15	0	to	—		
Seconds	cwt.	2	17	6	to	—		
Sodium acetate	ton	25	0	0	to	25	10	0
Arsenate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4½	to	0	0	4¾
Bisulphite, 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3	to	0	0	3½
Caustic, 70%	ton	17	10	0	to	18	0	0
Caustic, 76%	ton	18	10	0	to	19	0	0
Hydrosulphite, powder	lb.	0	1	5	to	0	1	6
Hyposulphite, commercial	ton	10	10	0	to	11	0	0
Nitrite, 96–98%	ton	29	0	0	to	30	0	0
Phosphate, crystal	ton	16	0	0	to	16	10	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	6	to	—		
Sulphide, crystals	ton	8	10	0	to	9	0	0
Sulphide, solid, 60–62 %	ton	15	0	0	to	16	10	0
Sulphite, cryst.	ton	11	10	0	to	12	0	0
Strontium carbonate	ton	50	0	0	to	55	0	0
Nitrate	ton	50	0	0	to	55	0	0
Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Flowers	ton	11	0	0	to	11	10	0
Roll	ton	9	15	0	to	10	10	0
Tartar emetic	lb.	0	0	11½	to	0	1	0
Tin perchloride, 33%	lb.	0	1	1	to	0	1	2
Perchloride, solid	lb.	0	1	3	to	0	1	4
Protochloride (tin crystals)	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.	ton	20	0	0	to	21	0	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	42	0	0	to	45	0	0
Dust, 90%	ton	50	0	0	to	55	0	0
Sulphate	ton	15	0	0	to	16	0	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	3	9	to	0	4	0
Acetanilid	lb.	0	3	3	to	0	3	6
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	8	to	0	3	0
Salicylic, B.P.	lb.	0	2	5	to	0	2	7
Tannic, leviss.	lb.	0	3	2	to	0	3	4
Amidol	lb.	0	7	6	to	0	8	0
Amidopyrin	lb.	0	13	6	to	0	14	0
Ammon ichthosulphonate	lb	0	1	10	to	0	2	0
Barbitone	lb.	0	17	6	to	0	18	6
Beta naphthol resublimed	lb.	0	2	6	to	0	2	9
Bromide of ammonia	lb.	0	0	10	to	0	1	0
Potash	lb.	0	0	8½	to	0	0	9
Soda	lb.	0	0	9	to	0	0	9½
Caffeine, pure	lb.	0	12	3	to	0	12	9
Calcium glycerophosphate	lb.	0	5	9	to	0	6	0
Lactate	lb.	0	2	0	to	0	2	3
Calomel	lb.	0	3	9	to	0	4	0
Chloral hydrate	lb.	0	4	3	to	0	4	6
Cocaine alkaloid	oz.	0	19	6	to	1	0	0
Hydrochloride	oz.	0	16	9	to	0	17	3
Corrosive sublimate	lb.	0	3	3	to	0	3	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	2	6	to	0	2	8
B.P. (75–80% eucalyptol)	lb.	0	2	7	to	0	2	9
Guaiacol carbonate	lb.	0	12	9	to	0	13	3
Liquid	lb.	0	11	6	to	0	12	0
Pure crystals	lb.	0	12	0	to	0	12	6
Hexamine	lb.	0	4	6	to	0	4	9
Hydroquinone	lb.	0	4	3	to	0	4	6
Lanoline anhydrous	lb.	0	0	7	to	0	0	6
Lecithin ex ovo	lb.	1	5	0	to	1	7	6
Lithi carbonate	lb.	0	9	6	to	0	10	0
Methyl salicylate	lb.	0	2	10	to	0	3	3
Metol	lb.	0	9	0	to	0	10	0
Milk sugar	cwt.	4	2	6	to	4	10	0
Paraldehyde	lb.	0	1	7	to	0	1	9
Phenacetin	lb.	0	7	6	to	0	8	0
Phenazone	lb.	0	8	6	to	0	9	0
Phenolphthalein	lb.	0	8	3	to	0	8	6
Potassium sulpho guaiacolate	lb.	0	7	3	to	0	7	9
Quinine sulphate, B.P.	oz.	0	2	3	to		—	

	Per	£	s.	d.		£	s.	d.
Resorcin, medicinal	lb.	0	5	9	to	0	6	0
Salicylate of soda powder	lb.	0	3	0	to	0	3	3
Crystals	lb.	0	3	0	to	0	3	3
Salol	lb.	0	4	0	to	0	4	3
Soda Benzoate	lb.	0	3	6	to	0	3	9
Sulphonal	lb.	0	17	0	to	0	18	0
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	11	9	to	0	12	3
Soda salicylate	lb.	0	8	6	to	0	9	0
Vanillin	lb.	1	3	6	to	1	4	6

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	2	0	to	0	2	3
Refined	lb.	0	2	6	to	0	2	9
Alphanaphthylamine	lb.	0	1	6½	to	0	1	7
Aniline oil, drums extra	lb.	0	0	9	to	0	0	9½
Salts	lb.	0	0	9½	to	0	0	10
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	2	6	to	0	2	9
Benzidine, base	lb.	0	4	9	to	0	5	0
Sulphate	lb.	0	3	9	to	0	4	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	1	to	0	1	2
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	4	to	0	1	5
Dinitrophenol	lb.	0	1	6	to	0	1	7
Dimethylaniline	lb.	0	2	9	to	0	3	0
Diphenylamine	lb.	0	3	6	to	0	3	9
H-Acid	lb.	0	4	9	to	0	5	0
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	8	6	to	0	9	6
Naphthionic acid, crude	lb.	0	2	6	to	0	2	8
Naphthionate of Soda	lb.	0	2	6	to	0	2	8
Naphthylamine-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Nevill Winther Acid	lb.	0	7	3	to	0	7	9
Nitrobenzol	lb.	0	0	7	to	0	0	8
Nitronaphthalene	lb.	0	0	11½	to	0	1	0
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol, base	lb.	0	8	6	to	0	9	0
Hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	9	to	0	0	10
Paranitraniline	lb.	0	2	7	to	0	2	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	12	6
Paratoluidine	lb.	0	5	6	to	0	5	9
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	10	to	0	0	11
Tolidine, base	lb.	0	7	3	to	0	7	9
Mixture	lb.	0	2	6	to	0	2	9

Essential Oils and Synthetics

Essential Oils.		£	s.	d.
Anise	c.i.f. 1/9 spot	0	1	10
Bay		0	12	0
Bergamot		0	13	0
Cajaput		0	3	3
Camphor, white	per cwt.	4	0	0
Brown	„	3	15	0
Cassia	forward position weak, c.i.f. 8/- spot	0	10	6
Cedarwood		0	1	6
Citronella (Ceylon)	forward position easier, c.i.f. 3/10½ spot	0	4	2
(Java)	spot and forward firm, c.i.f. 4/2 spot	0	4	7
Clove		0	9	6
Eucalyptus		0	2	6
Geranium Bourbon	firm	1	16	0
Lavender		1	6	0
Lavender spike		0	3	3
Lemon		0	2	10
Lemongrass	firm, per oz.	0	0	2½
Lime (distilled)		0	4	0
Orange sweet (Sicilian)		0	10	6
(West Indian)		0	8	6
Palmarosa	easier	1	0	0
Peppermint (American)		0	16	0
Mint (dementholised Japanese)		0	12	3
Patchouli	easier	1	5	0
Otto of Rose	per oz.	1	15	0
Rosemary		0	1	9
Sandalwood		1	5	0
Sassafras	firm	0	7	6
Thyme	2/6 to	0	8	0

Synthetics.		£	s.	d.
Benzyl acetate	per lb.	0	3	3
Benzoate	„	0	3	6
Citral	„	0	9	6
Coumarine	„	1	0	0
Heliotropine	„	0	8	0
Ionone	„	1	5	0
Linalyl acetate	„	1	2	6
Methyl salicylate	„	0	3	0
Musk xylol	„	0	12	6
Terpeniol	„	0	2	9

Research and The Royal Society

In his presidential address to the Royal Society's 261st annual meeting in London, on Friday, November 30, Sir Charles Sherrington said it had been decided to found Professorships with Sir Alfred Yarrow's gift of £100,000, and the appointments had fallen to Professor Alfred Fowler, professor of Astrophysics at the Royal College of Science, South Kensington, for his researches as a spectroscopist in astronomy, physics, and chemistry, and to Mr. G. I. Taylor, late meteorological adviser to the Air Force. Other gifts announced included a bequest of £50,000 by Dr. Ludwig Mond for research in natural science and a research Fellowship in metallurgy endowed by the Worshipful Company of Armourers and Braziers.

Alluding to the discovery of insulin, Sir C. S. Sherrington said that its promise of fruitfulness had proceeded satisfactorily towards fulfilment.

The following officers and members of Council were elected:—President, Sir Charles Sherrington; Treasurer, Sir David Prain; Secretaries, Mr. W. B. Hardy and Mr. J. H. Jeans; Foreign Secretary, Sir Arthur Schuster. Other members of Council:—Sir Frederick Andrewes, Professor C. G. Barkla, Sir William Bragg, Professor W. E. Dalby, Professor A. S. Eddington, Professor T. R. Elliott, Professor E. S. Goodrich, Sir Sidney Harmer, Sir Thomas Holland, Sir Frederick Keeble, Professor T. R. Merton, Professor H. F. Newall, Professor D. Noel Paton, Dr. A. Scott, Mr. F. E. Smith, and Professor J. F. Thorpe.

The meeting was followed in the evening by a dinner.

International Advertising Convention

In connection, with the forthcoming British Empire Exhibition the Associated Advertising Clubs of the World will hold their Annual Convention in London next year. The conventions have been held at New York for the past twenty years, and it is expected that some 2,000 representatives from the U.S.A. will attend the London conference, making a total of over 5,000 from all countries overseas. The joint presidents of the convention are Lord Leverhulme, Lord Burnham, and the present Lord Mayor of London, Sir Louis Newton. A sum of £50,000 is being raised, of which £17,000 has already been promised, for the expenses of the Convention and the entertainment of the visitors. A long list of engagements in the provinces is being arranged, and a Ladies' Entertainment Committee has been formed for the benefit of the wives and families who may accompany the delegates.

Purification of Zinc Sulphate Solutions

The success of experimental work on the purification of copper sulphate solutions, concluded by the U.S. Department of the Interior at the Berkeley, California, station of the Bureau of Mines, led the bureau to test the value of the hydrolytic process in removing iron and other impurities from zinc sulphate solutions. The process proved to be just as effective with zinc sulphate solutions as had been the case with copper sulphate solutions, although not as many tests were made as is desirable.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, December 6, 1923.

THE position in the heavy chemical market shows practically no change from last week. Limited quantities of German materials are still on offer, and prices are inclined to be higher. There has been a good inquiry for export.

Industrial Chemicals

ACID ACETIC.—Export inquiries still being received. Glacial 98/100%, £60 to £66 per ton; 80% pure, £49 to £50 per ton; 80% technical, £47 to £48 per ton, packed in casks, delivered c.i.f. U.K. port, duty free.

ACID BORACIC.—Crystals or granulated, £48 per ton; powdered, £50 per ton, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC (ICE CRYSTALS).—Demand still very poor, now quoted 1s. 1d. per lb., f.o.b. U.K. port.

ACID CITRIC (B.P. CRYSTALS).—Moderate inquiry and price unchanged at about 1s. 4¾d. per lb., less 5% ex store.

ACID FORMIC 85%.—Now quoted £52 per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC 80°.—£23 10s. per ton, ex station, full truck loads.

ACID OXALIC.—Rather better inquiry. Price 6d. per lb., ex store.

ACID SULPHURIC 144°.—£3 15s. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC (B.P. CRYSTALS).—Unchanged at about 1s. 1d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—17/18% Iron Free.—Quoted £8 5s. per ton, c.i.f. U.K. port, prompt shipment. Spot lots obtainable at about £8 12s. 6d. per ton, ex store.

ALUM, CHROME.—Moderate inquiry for small quantities, quoted £27 to £28 per ton, delivered.

ALUM POTASH (LUMP).—English material unchanged at about £10 17s. 6d. per ton, f.o.b. U.K. port. Spot lots of continental material still available at about £11 10s. per ton, ex store.

AMMONIA ANHYDROUS.—Very little demand. Now quoted 1s. 5d. per lb., ex station, prompt delivery.

AMMONIATE CARBONATE.—Lump, £29 5s. per ton; powder, £31 per ton, f.o.b. U.K. port for export.

AMMONIA LIQUID 880°.—Unchanged at 3d. per lb., delivered. Containers extra.

AMMONIA MURIATE.—Moderate export inquiry. Grey galvanisers quality quoted, £34 per ton f.o.b. U.K. port for export. Fine white crystals on offer at £27 5s. per ton, ex store, spot delivery.

AMMONIA SULPHATE.—25¼% material, £13 2s. per ton; 25¾% neutral quality, £14 5s. per ton, ex works, December delivery.

ARSENIC, WHITE POWDERED.—Spot lots of Cornish material available at about £73 per ton, ex store. Continental material quoted £63 10s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—English material unchanged at about £15 per ton, ex store.

BARYTES.—Finest white English unchanged at £5 5s. per ton, ex works. Good quality continental material offered at £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots £11 5s. per ton, ex station. Contracts 20s. per ton less.

BORAX.—Granulated, £24 10s. per ton; crystal, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English material unchanged at £5 12s. 6d. per ton, ex station. Continental offered at about £4 15s. per ton, ex store.

COPPERAS, GREEN.—Quoted £2 5s. per ton, f.o.b. U.K. port.

COPPER SULPHATE.—Moderate export inquiry. Price about £25 10s. per ton, less 5% f.o.b. U.K. port.

FORMALDEHYDE, 40%.—Spot lots now offered at about £65 per ton, ex store.

GLAUBER SALTS.—Fine white crystals unchanged at about £3 10s. per ton, ex store, spot delivery. Still on offer from the continent at about £3 per ton, c.i.f. U.K. port.

LEAD, RED.—English material unchanged at £45 per ton carriage paid U.K. stations. Continental now quoted £36 per ton, c.i.f. U.K. ports. Spot material about £37 10s. per ton, ex store.

LEAD, WHITE.—Continental material on offer at £41 10s. per ton, ex store, spot delivery.

LEAD, ACETATE.—Good export inquiry. English material now quoted £45 to £46 per ton, f.o.b. U.K. port. Spot lots of continental material still available at about £44 per ton, ex store.

MAGNESITE, CALCINED.—Finest English material offered a £8 per ton, ex station.

MAGNESIUM, CHLORIDE.—Spot lots now quoted £3 15. per ton, ex store. Still on offer from the Continent at about £2 10s. per ton, c.i.f. U.K. ports.

MAGNESIUM SULPHATE (EPSOM SALTS).—Commercial quality offered at about £5 per ton, ex store. B.P. quality, £6 5s. per ton, ex station, prompt delivery.

POTASH CAUSTIC, 88/92%.—Still on offer from the continent at about £30 per ton, c.i.f. U.K. port. Spot lots quoted £33 per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 5¾d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Offered from the continent at about £26 per ton, c.i.f. U.K. ports. Spot lots obtainable at about £30 to £31 per ton, ex store.

POTASSIUM CHLORATE.—Unchanged at about 3½d. per lb., ex store.

POTASSIUM NITRATE (SALTPETRE).—Quoted £32 per ton, ex store, spot delivery.

POTASSIUM PERMANGANATE (B.P. CRYSTALS).—Unchanged at about 10½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—Quoted 10½d. per lb., f.o.b. U.K. port. Spot lots about 10¾d. per lb., ex station.

SODA, CAUSTIC.—76/77%, £19 7s. 6d. per ton; 70/72%, £17 17s. 6d. per ton; 60/62%, broken, £19 2s. 6d. per ton; 98/99%, powdered, £22 15s. per ton. All ex station spot delivery. Contracts, 20s. per ton less.

SODIUM ACETATE.—Still on offer at £26 per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station. Alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—English makers' price about £10 per ton, ex station. Continental obtainable at about the same figure. Pea crystals quoted £15 per ton, ex store.

SODIUM NITRATE.—Refined 96/98% quality unchanged at about £13 5s. per ton, f.o.r. or f.o.b. U.K. port.

SODIUM NITRITE 100%.—Quoted £26 to £28 per ton according to quantity, f.o.b. U.K. port.

SODIUM PRUSSIATE (YELLOW).—In little demand. Price about 5½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £4 5s. per ton, carriage paid stations. Good export inquiry.

SODIUM SULPHIDE.—60/62% solid, £15 per ton, ex station; broken, £1 per ton more; 31/34% crystals, £9 7s. 6d. per ton, ex station.

SULPHUR.—Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton. Prices nominal.

TIN CRYSTALS.—Unchanged at 1s. 3¾d. per lb., f.o.b. U.K. port or delivered.

ZINC CHLORIDE.—98/100% solid offered at about £26 per ton, f.o.b. U.K. port, for export.

ZINC SULPHATE.—Continental material now quoted £15 per ton, ex store, spot delivery.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHOL.—Small export inquiry. Price 2s. 7d. per lb., f.o.b.

ALPHA NAPHTHYLAMINE.—Fair demand. Price 1s. 6d. per lb., delivered.

BENZOLE 90's.—Market weak. Supplies offered at 1s. 2¾d. gallon.

BENZIDINE SULPHATE.—Small home inquiry. Price, 3s. 9d. per lb., 100% basis, delivered.

BETA NAPHTHOL R.—Small home inquiry. Price. 1s. 3d. per lb. delivered.

BENZIDINE HYDROCHLORIDE.—Small home inquiry. Price 6s. 2d. per lb., delivered.

BENZOIC ACID.—Some home inquiries. Price 1s. 10d. per lb., delivered.

CROCEINE ACID.—Export inquiry. Price 2s. 9d. per lb. 100% basis.

DI NITROTOLUOL.—Large export inquiry. Price 1s. 1d. per lb., f.o.b.

MONO NITROTOLUOL.—Considerable export inquiry. Price 8¾d. per lb., f.o.b., drums included.

ORTHO NITROTOLUOL.—Large export inquiry. Price 4¾d. per lb., drums included.

PARANITRANILINE.—Small home inquiry. Price 2s. 7d. per lb., delivered.

PARA NITRO ORTHO TOLUIDINE.—Small export inquiry. 6s. per lb., 100% basis.

PHTHALIC ANHYDRIDE.—Small home inquiry. 2s. 2d. per lb., delivered.

Sir S. W. Royse's Monthly Report

DURING the greater part of November business has been fairly maintained, but recently the influence of the General Election has made itself felt, and inquiry has fallen away somewhat. Prices show little change, though the reported decision of the German Government to refuse to refund the 26 per cent. reparation duty may later materially affect values of German products. A good steady trade has been passing in sulphate of copper for both home and export account and makers are disinclined to sell far ahead at current rates. Green copperas has been moving freely and realising better prices. Acetates of lime remain very scarce, and are commanding high figures, but the demand for acetate of soda has fallen away somewhat. Acetic acid has been slow of sale and easier. Acetates of lead are in limited supply, especially brown, and, through the uncertainty of continental shipments, stocks are firmly held. Nitrate of lead has met with a steady inquiry. In carbonate and caustic potash the demand is only moderate, but prices are firm. Montreal potashes are offering freely from parcels now arriving, but business is nominal. Yellow prussiates of potash and soda are still in small request although prices seem now to have touched the bottom; consumption, however, is well below normal. A good export business has been done in arsenic, and producers are sold out for some little time ahead. Home trade requirements are, however, only small. There is severe competition from the Continent for business in tartaric acid, and prices are again lower; cream of tartar, however, has little change in value. Citric acid has been neglected and price is again lower. Consumers of bichromates have been booking contracts freely to end of 1924 at the concessions offered by British makers. In chlorates the inquiry for potash has been nominal, but a fair amount of trade has been done in soda. There is no change to report in borax or boracic acid. Oxalic acid is dull. The call for alum and sulphate of alumina has been only moderate and prices have been in buyers' favour. Lump salammoniac has been reduced £5 per ton. Bleaching powder, white caustic soda and alkali products generally have been in rather better demand for both home and export. Little change can be reported in tar products, consumers generally still showing reluctance to commit themselves to forward business. Benzols and toluols have shown no improvement, the further expected drop in price of petrol has not materialised, and prices remain unaltered. Solvent naphtha has continued in poor demand and lower values have been accepted. The steady call for creosote remains and prices are firm. Crude carbolic acid has an easier tendency, but little is offering and values are unchanged. In naphthalenes the inquiry for the refined quality has fallen away, with consequent lower values, but crude remains fairly steady. In pitch the poor inquiry has resulted in lower prices, but consumers do not seem attracted by the reductions offered. Continental users appear well covered for the time being and content to wait developments. In South Wales business is reported having been done considerably below the present quoted price. The home market for sulphate of ammonia is showing little activity, but export trade has been rather good.

The Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, December 6, 1923.

There has not been much movement in the chemical market here during the past week, due to some extent, probably, to the unsettlement caused by the elections. It is likely, moreover, that business will now be quiet again until after the turn of the year. Buying is restricted, so far as the home market is concerned, to supplies for immediate needs, with export business confined chiefly to orders on colonial account. In the meantime current values keep very steady.

Heavy Chemicals

Hyposulphite of soda is quiet, but prices keep up, photographic quality being quoted at £15 10s., with commercial on offer at £9 10s. to £10 per ton. Nitrite of soda is in rather short supply and values are again firmer at £28 10s. to £29 per ton. Bleaching powder is well held at £11 5s. per ton, though business is only on a moderate scale. Glauber salts meet with a quiet demand at £3 10s. to £3 15s. per ton. Sulphide of sodium still fails to attract very much buying interest, though prices are firmly maintained at £14 10s. per ton for 60–65 per cent. concentrated solid and about £9 per ton for crystals. Not much inquiry is being received for prussiate of soda and current quotations are rather easier at 5¾d. per lb. Caustic soda continues to meet with a good demand for shipment, with home consumption also on a moderately active scale; quotations are firm at from £16 17s. 6d. per ton for 60 per cent. material to £19 7s. 6d. for 76–77 per cent. Alkali is also steady and in fairly good request at £7 10s. per ton for 58 per cent. material. Saltcake is firm at £4 10s. per ton, the demand for shipment keeping up. Only a small demand for phosphate of soda is being met with, though values are unchanged from last week at £14 to £14 10s. per ton. Bicarbonate of soda continues to find a quietly steady market at £10 10s. per ton. Acetate of soda is quiet but fully maintained at £23 10s. to £24 per ton. Bichromate of soda is steady and in moderate inquiry at 4½d. per lb. Chlorate of soda is rather firmer at 2¾d. to 3d. per lb. Soda crystals are quiet but values steady at £5 5s. per ton.

There is a good deal of uncertainty regarding the position of caustic potash and carbonate of potash, and though values are higher, they also continue to be more or less nominal, caustic being round about £32 for 90 per cent. strength, and carbonate £24 for 90 per cent, and £26 for 96 per cent. Yellow prussiate of potash shows no sign of increasing activity and values are easier at 10d. per lb. Permanganate keeps quiet but steady at 8¾d. to 9d. per lb. Chlorate of potash is in fairly active demand at about 3d. per lb.

To-day's value of arsenic is about maintained at the level quoted last week—namely, £70 per ton, Manchester, for white powdered, Cornish makes; steady shipments are being made, and a fair number of inquiries are still coming to hand. Sulphate of copper is unchanged at £25 10s. per ton, f.o.b., but no improvement in the situation can be reported. A quiet demand for Epsom salts is being met with; commercial qualities are quoted at from £4 to £4 5s. per ton, with magnesium sulphate, B.P., offering at £6 to £6 10s. per ton. Nitrate of lead is not a very active section, but the price is very firm in sympathy with the metal, current quotations being between £43 and £44 per ton. The same remark applies to lead acetates, white being quoted at £44 and brown £45 per ton. Acetates of lime are firm at £22 for grey and £14 per ton for brown.

Acids and Tar Products

Tartaric and citric acids are steadier, although actual business is still only moderate. Tartaric is offered at up to 1s. 2d., and citric at 1s. 5d. per lb. Oxalic acid is unchanged from last week at 5¾d. per lb. Commercial acetic acid is quoted at £45 to £46 per ton for 80 per cent, and glacial at about £65

Pitch prices are easier in the absence of active buying for shipment and current quotations range from about £5 15s. to £6 per ton, f.o.b. The improvement in creosote oil continues and prices are firm at 9¼d. to 9½d. per gallon. Solvent naphtha is steady at 1s. 2d. per gallon, though business is on a small scale. Carbolic acid prices are easier, though supplies are not excessive; crystal is quoted at 1s. per lb. and crude at about 3s. per gallon. Naphthalenes are quiet with prices steady at £19 per ton for refined and £6 to £11 for crude.

Company News

HUELVA COPPER AND SULPHUR MINES.—A dividend of 3¾ per cent. for the year is announced.

UTAH COPPER CO.—The directors announce quarterly dividend of $1, an increase of 25 cents on previous distribution.

LEVER BROTHERS, LTD.—The register of share transfers will be closed from December 15 to December 31, both dates inclusive.

BRITISH OXYGEN CO.—An interim dividend of 9d. per share, free of tax, is announced payable to holders registered on November 29.

EXPLOSIVES AND CHEMICAL PRODUCTS, LTD.—The ordinary general meeting will be held at Finsbury Pavement House, London, E.C., on December 12, at noon.

ANGLO-AMERICAN OIL CO.—The directors announce an interim dividend of 5 per cent. (1s. per share in England and 22c. in America), payable on December 17, free of tax. This is the same as at the corresponding period a year ago.

THE AMERICAN CELLULOSE AND CHEMICAL MANUFACTURING CO., LTD.—The transfer books for the first mortgage ten year 8 per cent. convertible Sterling bonds will be closed from December 10 to December 31, inclusive, in accordance with the terms of the Trust Deed dated December 31, 1922.

CONSETT IRON COMPANY.—An interim dividend of 6d. per share, or 2½ per cent., has been declared on the ordinary shares for the year ending March 31. In respect of the preceding accounting period of nine months, no interim dividend was declared, but distribution at the rate of 5 per cent. per annum, free of tax, was made for the whole period.

SCOTTISH OILS, LTD.—The directors have addressed a circular to the shareholders, intimating that owing to the depressed state of the oil trade and pending the result of the full year's working, they are unable to recommend payment of the dividend in January next on the seven per cent. non-cumulative participating preference shares.

DORMAN, LONG AND CO., LTD.—The directors recommend a dividend on the cumulative preference shares at the rate of 6 per cent. per annum, less tax, for half-year ending December 31 to shareholders registercd December 18, payable December 31; also a dividend on preferred ordinary shares at the rate of 8 per cent. per annum, less tax, for half year ending September 30 to shareholders registered December 6, payable December 31; but do not recommend any dividend on the ordinary shares. No dividend was paid on the ordinary shares for the year 1921–22.

THE CASSEL CYANIDE CO., LTD.—The net profit for the year to September 30 last, together with the balance from last year amounted to £67,388. The interim dividend of 3d. per share absorbed £17,625, and the directors recommend a final dividend of 6d. per share, less tax, requiring £35,250, leaving £14,513 to be carried forward. The thirty-ninth ordinary general meeting will be held at 7, West George Street, Glasgow, on Wednesday, December 12, at noon. The transfer books of the company will be closed from December 12 to December 31, both days inclusive.

NORTH BROKEN HILL, LTD.—During the year ended June 30 last the amount of sulphide ore treated was 171,555 tons, producing 35,198 tons lead concentrate, and 32,054 tons zinc concentrate. This compares with 92,340 tons treated in 1921–22, yielding 18,200 tons and 17,880 tons of lead and zinc concentrate respectively. The profit, after allowing for mine expenditure, taxation, etc., and reserve for depreciation was £284,780, to which is added £30,000 brought forward. During the year three dividends of 2s. per share (or 30 per cent. have been paid; £13,333 has been placed to Debenture sinking fund reserve, while £52,000 has been appropriated for plant expenditure, leaving a balance of £69,447. The assets at June 30 last show a surplus over liabilities of £532,454 (exclusive of shares and debentures in other companies).

New Discovery of Natural Gas

A LARGE FLOW of natural gas of good quality, said to be sufficient to supply the whole island with gas for domestic use for many years to come, has been located in Barbados by the British Union Oil Company.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

RAW MATERIALS FOR AUSTRALIAN INDUSTRIES.—A Melbourne manufacturers' agent and importer and exporter desires to obtain the representation of British manufacturers of raw materials used in Australian industries, such as aluminium, chemicals, oils, colours, tanners' supplies, etc. He will operate on a commission basis, the importer paying cash against documents or by sight draft. (Reference No. 600.)

Position of Drugs and Chemicals in Japan

A REPORT on the present position of stocks of drugs and chemicals, etc., in Japan has been received by the Department of Overseas Trade from the Acting British Consul at Osaka, copies of which, together with lists of importers in Japan, may be obtained by British firms upon application to the Department, 35, Old Queen Street, London, S.W.1. (Reference D.O.T. 11490/85/F.E./C.C./2.)

Air Compressor for Filtration Plant

H.M. TRADE COMMISSIONER at Toronto reports that the City of Toronto Department of Works are inviting tenders for the supply and delivery of one electrically driven air compressor, with accessories, and one separator. Sealed tenders addressed to The Chairman of the Board of Control, City Hall, Toronto, must reach the City Hall by registered post only not later than noon, January 15, 1924. British firms desirous of receiving further particulars of this inquiry should apply to the Department of Overseas Trade (Room 48), 35, Old Queen Street, London, S.W.1. (Reference D.O.T. 12641/E.D./E.C./2.)

The Glass Trade and Protection

THE condition of the British manufacturing glass trade and its needs, was the subject of remarks by Mr. Walter L. Chance, a member of the firm of the great glass firm of Chance, of Spon Lane, Smethwick, at a political meeting on Saturday, December 1, in that town. Mr. Chance said that for the first time in the century-old industry of Spon Lane Glassworks, it had become necessary for a director to speak to the people of Smethwick from a political platform. At present they were doing all they could, but they were up against competition such as they had never experienced. Fifty years' ago they were employing double the number of men they were employing to-day. The municipal houses of Smethwick, West Bromwich, and other towns were glazed with glass made in Belgium. It would not have made a farthing difference to the cost of the window panes if they had had English glass instead of foreign, and the glass workers would have had employment. With regard to spectacle glass, Mr. Chance stated that for spectacle blanks they charged 1¾d. a pair, whereas the German price was just 1d. They had half their furnaces idle because they had no tariff on spectacle glass.

Conversion of Clays to Aluminium Sulphate

IN connection with the development of a simple, cheap process of preparing pure solutions of aluminium sulphate, work has been undertaken by the U.S. Department of the Interior at the Pacific Experiment Station of the Bureau of Mines on sulphating clays by various methods. Sulphate roasting, using gases containing varying amounts of sulphur dioxide to sulphate the aluminum silicate of the clays, proved impracticable, but favourable results were obtained by treating the clays with sulphuric acid. A wide series of aluminum silicate products was treated at various temperatures with differing strengths of acid. In general, nearly all the silicates were decomposed with fair efficiency at temperatures up to 200°C. and with acids containing 50 to 70 per cent. sulphuric acid. The easiest silicate to decompose was bentonite, but many of the kaolins were quite easily attacked. Feldspars are much more resistant.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

BLUNT, W. H., AND SON, 69½ and 70, Snow Hill, Birmingham, wholesale botanic druggists. (C.C., 8/12/23.) £25 19s. 3d. October 22.

ISON'S EYE AND EAR DISPENSARY, LTD., 71, Great George Street, Leeds, dispensers. (C.C., 8/12/23.) £16 15s. 6d. October 24.

TURNER, THOS. H., AND CO., Crown Works, South Parade, West Hartlepool, drysalters. (C.C., 8/12/23.) £17 4s. 2d. October 31.

Receivership

BENNISONS, LTD. (R., 8/12/23.) P. S. Booth, of Kimberley House, Holborn Viaduct, E.C., was appointed receiver on November 22, 1923, under powers contained in a debenture dated September 27, 1922.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

CLARKES CHEMISTS (SOUTH WALES), LTD. (late LATIMER DAVIES, LTD.), Newport, Mon. (M., 8/12/23.) Registered November 21, £2,000 1st debenture, to Branch Nominees, Ltd., 15, Bishopsgate, E.C.; general charge. *Nil. April 26, 1923.

CLEMENT AND JOHNSON, LTD., London, W.C., chemists. (M., 8/12/23.) Registered November 27th, £100, £200 £100, £200 and £100 debentures part of £60,000; general charge. *£38,700. January 12, 1923.

REYNOLDS AND BRANSON, LTD., Leeds, chemists. (M., 8/12/23.) Registered November 23, £17,500 mortgage (including £9,000 transferred) (supplemental to mortgage dated October 30, 1919), to W. S. Hannam 4, East Parade, Leeds, solicitor and another; charged on properties in Briggate, etc., Leeds; also registered November 23, £4,000 further charge (supplemental to transfers of mortgages dated July 23, 1920, and November 8, 1923, securing £5,000), to Misses M. L. and C. E. Musgrave, Farcliffe, Bradford; charged on land and premises in Commercial Street, Leeds. *£21,250. June 21, 1923.

WYKE DYEING CO., LTD. (M., 8/12/23.) Registered November 26, £3,600 debentures (secured by Trust Deed dated November 23, 1923); charged on premises at Towngate, Wyke, also general charge.

Satisfactions

BROOKSBANK (E.) AND CO., LTD., Manchester, soap makers. (M.S., 8/12/23.) Satisfactions registered November 28, £12,000, registered December 5, 1908; and all moneys, etc., registered July 30, 1923.

REYNOLDS AND BRANSON, LTD., Leeds, chemists. (M.S., 8/12/23.) Satisfaction registered November 24, £1,250 registered April 28, 1919.

WELSH SILICA CO., LTD., Connahs Quay. (M.S., 8/12/23.) Satisfactions registered November 22, £250, part of amount registered November 18th, 1919, and £1,000, part of amount registered December 11th, 1919.

London Gazette

Winding-Up Petition

CLEVELAND SOAP CO., LTD. (W.U.P., 8/12/23.) A petition for winding-up has been presented, and is to be heard at the Royal Courts of Justice, Strand, London, on December 11, 1923.

Companies Winding Up Voluntarily

BRITISH ORION OIL CO., LTD. (C.W.U.V., 8/12/23.) A. J. Pegg, 308, Winchester House, Old Broad Street, appointed liquidator. Meeting of creditors, 308, Winchester House E.C., on Friday, December 14, at 11.30 a.m.

BURLINGTON INDUSTRIAL LABORATORIES, LTD. (C.W.U.V., 8/12/23.) C. H. Whatley, 6-7, Charing Cross Chambers, Duke Street, Adelphi, W.C.2, appointed liquidator.

New Companies Registered

BRITISH SYNTHETICS, LTD., Imperial House, Kingsway, London, W.C.2. Chemical dye manufacturers, and manufacturers of synthetic products, etc. Nominal capital, £7,000 in £1 shares (6,000 preference and 1,000 ordinary).

CEMENT AND STEEL, LTD., 147, Fenchurch Street, London, E.C. Distillers, dye and gas makers and metallurgists, etc. Nominal capital, £1,000 in £1 shares.

COCKSON'S, LTD., 32, Aldersgate Street, London, E.C.2. Manufacturing wholesale and retail chemists, druggists, and drysalters, etc. Nominal capital, £1,000 in £1 shares.

McCULLOCK AND CO (BRADFORD), LTD., 134, Manchester Road, Bradford. Chemists, druggists, chemical manufacturers, and dealers, drysalters, etc. Nominal capital, £1,000 in £1 shares.

NORMANBY PARK TAR SUPPLY CO., LTD.—Tar distillers, manufacturers of and dealers in coke, coal, tar, pitch, ammoniacal liquor and other residual products, carbonisers of coal, naphtha distillers, manufacturers of alizarine, coal tar colours, and all kinds of dyes and dyestuffs. Nominal capital, £15,000 in £1 shares. Solicitors: Coburn and Co., 5, Drapers Gardens, London, E.C.2.

STANDARD VARNISH WORKS (OF GREAT BRITAIN), LTD., 34–35, Norfolk Street, Strand, London. Makers of and dealers in varnish colours, paints, enamels, white and other lead, etc. Nominal capital, £2,000 in £1 shares.

Need for Improved Literature on Organic Chemistry

A LECTURE was given at Huddersfield before the local chemical society on Friday, November 23, by Mr. L. A. Coles, entitled "Criticisms of Chemical Literature." The literature dealing with analytical chemistry was full and accurate though some of the methods given were somewhat specialised. The literature on inorganic chemistry was full and could almost be said to be complete, while the drawback in the case of physical chemistry was that the definitions were apt to be vague. In literature on organic chemistry, a direct contrast to that on inorganic was met. It was very full, but very often inaccurate, and this in a branch of the subject where accuracy was most needed. In many text-books out-of-date methods were given, and one found that even values for melting points varied considerably from book to book. The more advanced text-books were extracts from patent literature. There was no guarantee that methods given would work, and it was often found that they would not. Most modern research was done in the laboratories of firms, and many accounts and methods given were vague, although not intentionally so. It was necessary to carry out more research on the given method in order to obtain results. Attempts had been made to systematise the literature, but these were mostly extractions, in which no attempt was made to separate the good and the bad. Thus the literature was hindering research in that branch of chemistry. He considered that a complete overhauling of the literature in existence on organic chemistry was necessary. The work would have to be taken in hand by an international committee, and certain sections of the literature would have to be allotted to different countries. It would hinder other research, but once accomplished, research in organic chemistry would go on at a much greater rate than at present.